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THE ANNUAL REPORT OF THE PARIS GAS COMPANY.

From the *Journal des Usines a Gaz*, for the month of May, we make some extracts relating to the operations of this company.

It is to be borne in mind that the exclusive privilege of selling gas is given to a single company, which was formed by consolidating a number of opposition companies in the year 1855. For this privilege the company divides with the city, in equal proportions, all the profits over and above a dividend fixed by the terms of the contract. The city's share of the profits, under this arrangement, was about $1,670,000 during the year 1877. The amount received from sales of gas by the company was about $9,640,000. The number of consumers was 124,178; of these 6,388 were new consumers during the year.

Sixty-nine per cent. of these new consumers were supplied from the "conduites montantes," or the service pipes placed in large buildings, occupied by several parties, at the expense of the company.

The number of street lamps was 42,486—an increase of 2,306 over the previous year.

During the past 22 years the annual consumption has increased from 40,774,400 cubic metres, in 1855, to 101,197,228 cubic metres in 1877. The "day consumption" is 42 per cent. of the daily send out. The par value of the shares is 250 fr., and the dividend last year was 62 frs. per share.

The capacity of the works, at the beginning of 1877, was 210,375,000 cubic metres, and, at the close of this year, it is expected that this will be increased to 236 million cubic metres.

The stock and bonds of the company amount to 169,145,447 francs, of which 84 million francs is in stock.

The cost of making the 191 million cubic meters of gas is given at 40 million francs, divided about as follows:

Materials	20	million frs.
Service of works	5	"
Lighting and canalization	1½	"
Central administration	8½	"
Municipal and state charges	4½	"

The receipts amounted to about 69 million frs.

Among the most important items are noticed, from—

Sales of gas	48	million frs.
Coke	15	"
Tar	2	"
Ammoniacal liquor	½	"
Chemical products	1	"

The above figures are given to enable our readers to form some definite idea of the magnitude of the operations of this company. They have something like 20 different works in various parts of the city, but all under one management. The price of gas is not far from seven francs, or about $1.50 per thousand cubic feet. The strictest economy is practiced; and, as will be seen, a very large revenue is obtained from their residual products. Besides this the company makes and sells a large number of gas stoves, engines, etc., by which their day consumption is largely increased. They make their own fire-brick, retorts, etc.; and, in fact it has been said, that everything that goes into their works leaves it in a merchantable form. There is nothing wasted. As to the street lamps, they are paid liberally for them, and they are very close together; but the city gets a very large portion of this money back again in the form of dividend, or share of the surplus over and above the regular dividend allowed.

Everything works harmoniously and well. Here is the strongest possible argument against setting several to do that which one can do much better, more economically, and more satisfactorily. Still our municipal statesmen in this country cannot be made to see the folly of having what they term competition in supplying gas either to the people or the public. Give any one set of capitalists a satisfactory guarantee that they should be allowed to light New York city for 50 years, and there would be no trouble about selling at a figure that would be so ridiculously low, as compared with the past, or even present prices, that every one would wonder that they had allowed themselves to be deceived with the popular cry, so easily used by demagogues, about competition, monopoly, etc., etc. The gas business should be a regulated monopoly; but there must be equal guarantees and protection on both sides.

DEATH OF MR. TRUMAN BECKWITH, OF RROVIDENCE.

During the last month another of the oldest of gas company officers has passed away. Mr. Beckwith was one of the first board of directors of the Providence, R. I., company, and has been in the directorate ever since.

The Providence *Journal* thus speaks of him:

"Mr. Beckwith leaves a name behind him which is most honorable and honored. He was temperate, frugal, attentive to his business, upright, genial and conservative. He never indulged in vagaries, in speculation, or affairs outside of his

immediate concern. He was one of those valuable men who build up wealthy cities and splendid commonwealths by doing their duty wherever and whenever it appears. He was averse to boastfulness, avoided notoriety, and never pretended the ornamental. He was a strong, sterling and successful business man, and deserves one of the honorable places in the history of the city."

Addenda to Paper on "Physics of Coal Gas."*

By Robt. Briggs, C. E.

The table of figures of reduction of volumes to weights may be found to show the percentage of weights of the constituents, etc., as follows:

	Constituents.			Average volumes per cent.		Specific gravity.		Sum.	Weight per ct.	Weights, lbs. in 10c. ft. gas @ 70°.
H	Hydrogen			45	×	0·0692	=	3·114	7·3171	0·23340
CH_4	Marsh gas			36	×	0·559	=	20·124	47·2861	1·50835
C_2H_4	Olefiant gas			8	×	0·981	=	7·840	18·4407	0·58823
CO	Carbonic oxide			6	×	0·967	=	5·802	13·6331	0·43488
CO_2	Carbonic acid			2	×	1·524	=	3·048	7·1620	0·22846
$4N+O$	Air			2	×	1·000	=	2·000	4·6995	0·14955
H_2O	Vapor of water,			1	×	0·622	=	0·622	1·4615	0·04662
								42·558	100·0000	3·18985

The absolute temperature of the flame of marsh gas, computed by the same method used in the cases of hydrogen, carbon and carbonic oxide in the paper, is

Marsh gas, $CH_4=\frac{3}{4}C+\frac{1}{4}H=13220°+3085°=16305°$.

* Gas-Light Journal, April 2d, 1878.

Regeneration of Foul Lime.

Philosophical Society of Glasgow.

Chemical Section.

Jan. 14, 1878.

Prof. John Ferguson, M.A., President, in the Chair.

After the confirmation of the minutes, a paper was read "*On Bishop's Improved Process of Regenerating the Lime used in the Purification of Coal Gas*," by Mr. John Mayer, F.C.S., Secretary of the Section. The author said that he had for many years taken a great deal of interest in the chemistry of gas purification, and the secondary or waste products of the gas manufacture, and that during the last few months the process about to be spoken of had impressed itself on his mind as one which was a great step in advance, inasmuch as its use bade fair to be attended with a large amount of economy, and to diminish very considerably the nuisance which seemed invariably to result when "fouled" gas lime was permitted to remain about a gas works, and more especially when it was being removed as a so-called "waste product." Almost from the very birth of the gas-making industry the basic-alkaline earth, lime, had been used in the purification of gas. For a considerable period, down even to within the recollection of some of those then present, the purifying material was used in the form of a thick milk of lime, in east iron tanks; but though the operation was very successful, from a chemical point of view, it was attended with mechanical difficulties of so serious a character—in addition to the difficulty of so disposing of the very fœtid waste lime liquor as not to create a nuisance—that it was eventually superseded by the use of dry lime purifiers, the slaked lime being laid on trays or grids in covered chambers or tanks, and allowed to remain exposed to the contact of the gas in its passage from the retorts, where it was generated, to the gasholder, where it was stored. Until within the last eighteen or twenty years, caustic or hydrated lime reigned almost supreme as the purifying agent; but when it was experimentally demonstrated that hydrated peroxide of iron might be used with great effect in removing the impurities from coal gas, it began to establish its claims and its popularity over lime in many of the large gas works throughout the kingdom, and especially in those of the Metropolis. One of its chief advantages was that it did not, by exposure in the open air, become a nuisance in the same degree as spent lime did; and another was, that it could be used over and over again. But it was found that, by itself, it was not sufficient for the removal of all the impurities, and some gas managers got into the habit of using it in admixture with slaked lime and sawdust, while others considered it preferable to use the lime and oxide of iron in separate purifiers, which was the plan now generally had recourse to where the last-named compound was employed as a purifying agent. In small gas works, however, it might be said that lime was almost exclusively used in the purification of the gas, which was also the case in many works of pretty considerable size. Such a process, therefore, as that to be briefly noticed in the paper might well aim at becoming very general, if it could only be satisfactorily shown that it was a success—chemically, mechanically, and commercially.

Before enlarging upon the process, the author noticed briefly what were the impurities which it was desired to remove from the gas. He next spoke of the nature of spent or fouled lime. He then quoted several analyses of spent lime at some length, and said that the product in question was of a very variable composition, owing partly to its freshness, partly to the length of time during which it had been exposed to the action of the gas in the purifiers, and to other causes. There was no doubt, he remarked, that by allowing the spent lime to weather in the open air it would, in course of time, consist largely of sulphate of lime, in consequence of the slow oxidation of the sulphide and other easily transformed calcium compounds. After referring to certain very suggestive remarks of Mr. Lewis] T. Wright, on the chemical action which takes place in a dry lime purifier, the author proceeded to say that, as to the very complex composition of "fouled" gas lime there could be no doubt whatever; but how to turn the substance to account profitably, and reduce the nuisance connected with it to a minimum, was a question that had occupied the attention of many gas managers and chemists. Certainly the most successful worker in that field of practical investigation up to the present time, so far as he was aware, was Mr. George R. Hislop, F.C.S., the well known manager of the Paisley Corporation Gas Works. That gentleman had attacked the problem of regenerating or revivifying spent gas-lime some years ago. He took some large blocks, and calcined them with coke in the usual way, and the results were upon the whole very successful. The great difficulty, however, was how to re-calcine the smaller portions of the lime, and, in order to get over that difficulty, he had a quantity of gas lime passed through a pan-mill, in which the lime was broken down, in order to give it a suitable consistency, and fitted for being easily moulded into bricks, which were introduced into a kiln in the usual way. So far the process satisfied him. The bricks were well formed, and in a way that they could be handled and placed in the kiln. But he was not entirely satisfied with the process, as it was impossible, under ordinary circumstances, to make sure that the lime in the centre of the bricks was completely recalcined or revivified, and he eventually came to the conclusion that the spent lime must be recalcined in as fine a state of division as possible. His experiments gradually led him to devise a furnace or kiln of special construction for the purpose, and with it he had now been working on a practical scale for many months. Indeed, he had informed the author that the lime which he was using in the purification process at his works was that which he obtained by calcining raw limestone in the ordinary way about a year ago, and that he had now entirely discarded raw limestone, whereas he formerly used 800 to 1000 tons of that material per annum.

The author said that he had seen the lime-generating process in operation several times at the Paisley Gas Works; he had also seen it in operation at the Greenock Corporation Gas Works; and in the hands both of Mr. Hislop and Mr. Samuel Stewart it seemed to work exceedingly well, and to be, indeed, a very marked success. Proceeding to describe the process, he said the kiln consists of a series of four calcining chambers arranged vertically over each other, and, together with the furnace underneath them, occupying the space of one of the ovens of the retort-bench. They are about 9 feet long and 2 feet 6 inches wide. The uppermost, which is the drying-chamber, has a capacity fully equal to the united capacity of the other three, which are the calcining chambers proper, and are each about 9½ inches high. All the chambers are constructed of fire-clay tiles and blocks of similar form. The gases from the furnace pass to the further end of the same, where, by means of two ports at the corners, they pass into the lowermost calcining chambers over the top of, and in close contact with, the spent lime to the fore end of the same; thence up through two ports as before, traversing the second chamber in the same way; then the third chamber; and, lastly, the topmost or drying chamber, from which they enter the main flue, the entrance to which is regulated by a suitable damper. The spent lime is first charged into the drying chamber by means of a shovel, and it remains in that chamber during the regeneration of the contents of the chambers underneath; and after the latter have been discharged into an iron waggon or barrow, the contents of the upper chamber are discharged into the lower chambers through a port near to the front of each, the opening of which is covered with a suitable

ti le, as the chambers are successively filled, commencing at the lowermost, and the gases from the furnace, while passing over, and in close contact with, the spent lime, disengage the carbonic acid and other impurities. Air is admitted through ventilating flue-boxes, placed on either side of the furnace near to the ground, whence it is conveyed to, and directed against, the fuel in the furnace near to the centre of the furnace-bars, where it issues from a number of holes, about 1¼ inches in diameter, pierced through fire-clay blocks, which form part of the sides of the furnace. These air holes pass through the blocks with a dip of about 1½ inches towards the furnace-bars. In practice it is found that one man can attend to two sets of chambers such as those just described, and regenerate upwards of 50 cwts. of spent lime per shift of twelve hours, with a consumption of about 8 cwts. of fuel, which is usually the coke of ordinary cannel coal.

Mr. Mayer remarked that, so far as the drying and recalcining of the spent lime were concerned, the operations which he had seen at Paisley and Greenock were practically the same; but he had learned from Mr. Hislop that he was making arrangements for carrying out another part of his process, and which, indeed, he had seen in progress. When oxide of iron, he said, was employed along with lime in the purification of the gas, the last-named compound was produced chiefly in the state of carbonate, and was therefore ready for recalcination immediately that the purifier containing it was thrown out of use; and, according to Mr. Hislop, it might be fouled and revivified for an indefinite number of times, say a hundred, more or less. But when no oxide of iron was employed, the lime produced was largely charged with sulphur, as well as carbonic acid and other impurities; and while that lime might be restored from fifteen to twenty times or more, before becoming exhausted by its combination with sulphur, forming sulphate of lime, that gentleman had provided in his process that—in order to render the lime more durable and "go on for ever"—the waste gases from the retort furnaces, boiler furnaces, or the calcining chambers themselves, consisting chiefly of carbonic acid, should be drawn off by an exhauster or pump, and forced up through the spent lime, after being shut off from the gas as fouled in the purifier. His intention was to connect the chimney, or main flue, with the purifiers, by means of cast iron pipes laid in a cold water condenser. By that arrangement the carbonic acid from the sources referred to would, on being passed through the sulphuretted lime in the purifier, displace the sulphur chiefly in the form of sulphuretted hydrogen, and combine with the lime to form lime carbonate. The discharged gases from the fouled purifier would then be passed through oxide of iron in an adjoining purifier, the residual gaseous matter being allowed to pass into the open air or into a chimney, and the oxide of iron, after absorbing all the sulphurous impurities, as in gas purification, being removed and exposed to the air for revivification in the usual manner, and the carbonated lime transferred to the calcining chambers, and restored to the condition of quicklime as before.

In concluding, the author regretted that, owing to the short time at his disposal for preparing the paper, there had been no opportunity for getting analayses made of gas lime which had been a number of times fouled and recalcined, so as to see if there was any material and gradual increase in the amount of sulphate of lime. On that point, however, he had been informed that there seemed to be no diminution in the purifying power of recalcined gas lime. In other respects the paper had been incomplete; but he was glad to see Mr. Hislop and Mr. Stewart present, both of whom would doubtless be willing to supplement his remarks from their own practical experience of the process.

A discussion then took place.

Mr. J. J. Coleman, F.C.S., said that it would be essential to the financial success of the process that all sulphur compounds should be removed from the gas prior to the latter being brought into contact with the lime, otherwise there would, he thought, be a progressive deterioration of the lime each time it was recalcined. He considered that this would practically be very difficult to manage. If the lime were deteriorated only to the extent of 10 per cent. at each reburning, by accumulation of sulphates or sulphides—a not unreasonable possibility—then by the end of the fifth re-calcination the cost of reburning would exceed that of fresh lime. The removal of sulphur from coal gas by ferric oxide, and its recovery from the oxide by conversion into sulphurous acid in the vitriol chamber furnace, or its recovery in the free state by the process of Pelouze (now in operation in London)—namely, by solution in hot coal-tar naphtha and subsequent crystallization—were operations of great interest, and likely to have an important influence in rendering us independent of foreign sources of supply.

Mr. Samuel Stewart (Greenock) remarked that he had been using the process, and burning the spent lime, for about two months, during which time he had re-burnt about 100 tons of the lime, or, in other words, about double that quantity of spent lime, for the latter lost nearly half its weight in the process of revivifying. He had found no difficulty or mystery in recalcining the spent lime. The recalcining chambers at the Greenock gas works occupied the place of an ordinary oven of retorts in the retort-bench, and they were worked at six-hour charges, producing something like 45 cwts. of reburnt lime per 24 hours. The lime was found to stand in the purifiers equally well with, and also about the same time as, the "shell" lime, even after being recalcined several times. He said, however, that he only used lime to remove the carbonic acid from the gas, the sulphuretted hydrogen being removed by means of bog-iron ore. The spent lime, therefore, contained very little sulphur. Speaking of the "life" of the chamber, he said that he estimated that it would be equal to the production of from 800 to 1000 tons of reburnt lime; and he calculated the expense of renewing the chamber at from £40 to £50, or about 1s. per ton of reburnt lime. He found that the cost of labor and fuel did not exceed 9s. per ton, or, adding 1s. for renewal, say 10s. per ton, or about one-half the cost of new "shell" lime. Not having had an opportunity of getting either the spent or reburnt lime analyzed, he was unable to say if all the impurities were driven off by the reburning.

Dr. Wallace, Gas Examiner (Glasgow), remarked that if any sulphur compounds remained in the spent lime, the burnt lime would contain a sulphate. He had found that when limestone containing pyrites was calcined, the products retained fully half of the sulphur in the form of sulphate. The value of the process would, therefore, depend very much upon the extent to which the sulphur compounds were got rid of before calcination. Again, the utility of the invention would depend upon local circumstances. In London, for example, the process would be invaluable; and in places where the spent lime could not be disposed of advantageously, it would undoubtedly be profitable. But in such towns as Glasgow, where the waste lime was readily sold, it became simply a question of cost whether it would be better to revivify the spent lime or use fresh material every time. The price got for spent lime in Glasgow was from 1s. 6d. to 2s. 6d. per ton, which was equal to from 3s. to 5s. of the cost of the original lime, and that amount added to 9s. as the probable cost of revivifying, came pretty close upon the value of burnt Irish lime—that was to say, about 16s., all charges included.

Mr. G. R. Hislop (Paisley) said that, not being a member of the Society, he had attended, on the invitation of Mr. Mayer, simply as a listener to what might be said on the subject discussed in the paper. He expected that had Mr. Mayer's paper come on a week or two later, he would have been in a better position to state important facts in connection with the subject, and to have been able to submit analyses of the lime at the different stages of the process, and after several reburnings; but he was only then engaged in perfecting the desulphuretting part of the process. Undoubtedly it was of great importance to have the last vestige of the sulphur discharged from the fouled lime before recalcining it, and this he proposed to do by means of the carbonic acid produced in the gas-retort furnaces, sufficiently cooled and passed up through the lime in the purifiers, so soon as they were turned off as fouled. In that way the carbonic acid gas, passing through the myriads of channels formed in the lime, would very speedily discharge the sulphuretted hydrogen, which in its turn would be passed into the oxide of iron. The simple acetate of lead test would indicate when the whole of the sulphuretted hydrogen had been expelled. By that part of the process the valuable sulphur, which had been largely, and in most cases, thrown away as waste, would be recovered. It was by no means a small quantity of sulphur that was allowed to go to waste; for, after allowing for what might be removed by the scrubbers and washers, it would amount to from 10 lbs. to 13 lbs., per ton of coal carbonized. That was a point not to be lost sight of. Mr. Stewart, who like himself, purified his gas partly by oxide of iron, intended, in the meantime, to burn his lime with what little sulphur it might contain; and, with regard to the number of times it might be recalcined, he (Mr. Hislop) might state that, of the 60 or 70 tons of lime which he had in use at the Paisley gas works for the past twelve months, a portion which had been fouled forty-five times (and in several instances made specially foul for the purpose of experiment) contained only 22½ per cent. of sulphate of lime. Then as to the value of the spent lime, as ordinarily produced—like Mr. Stewart, he had always had considerable difficulty in getting it disposed of. Not unfrequently, at least in midwinter, he had sold it at from 4d. to 10d. per ton. But, even supposing that 1s. 6d. per ton could be got for the spent lime, as Dr. Wallace had stated, and that it required nearly two tons of spent lime to produce one ton of quicklime, Mr. Hislop found that well nigh—if not even fully—this sum would be saved in the preparation alone of the reburned lime, which required no riddling or screening, inasmuch as it contained no stones, and altogether it was much more speedily prepared for use. Speaking of the cost of producing quicklime direct from the raw stone, he said that, before resorting to the regular use of his vivifying process, he had produced all the lime required at the Paisley gas works from Irish limestone, and he quite agreed with Dr. Wallace on the question of first cost. The material could

not be produced for less than the amount mentioned—namely, 16s. per ton.

The President then summed up the discussion in a few remarks, and, in proposing the thanks of the Section to Mr. Mayer for his interesting paper, he expressed a hope that another paper on the subject would be brought forward at a future meeting, in which the desired analytical results would be embodied.—*Chemical News*, *March 1st*, 1878.

A New Method for Producing Cheap Heating Gas for Domestic and Manufacturing Purposes.

By S. W. Davies, A.R.S.M.

It will be within the memory of many members of this Society that, in the year 1872, a sum of money was placed at the disposal of the Council of the Society of Arts, for promoting, by prizes or otherwise, economy in the use of fuel for domestic purposes.

A committee was formed, to whom was entrusted the task of deciding on the best means for carrying into effect the wishes of the donor. A number of prizes and medals were offered for the best and most economical apparatus for cooking and heating, both by coal and gas. After a careful investigation of the claims of a large number of exhibitors, who forwarded their apparatus for trial in buildings especially erected for the purpose at South Kensington, the committee decided that no prize could be awarded. But, although it was found that inventors had made little advance in the direction of economy of fuel worthy of the name, no doubt minds were set to work to try and fulfil the conditions under which the prize had been offered. Among the various inventions which made their appearance after the conclusion of the Society of Arts experiments, was one by Mr. Joshua Kidd, the principle of which was that the gases from ignited coal were mixed with the hydrogen from decomposed water.

The complete gasification of the fuel used was a remarkable feature of the process, and it was this fact which led some gentlemen interested in the subject to adopt the idea, and to purchase Mr. Kidd's patent. Two years of patient trial analysis, and experiment have enabled them to alter and adapt the principle contained in the original invention. Difficulties of all sorts have been overcome, and, although they are still on the way to improvement of the gas and its application in many directions, both for heating and lighting, they consider that, in its present state, it is of too great public importance, where a cheap heating gas is required, to delay any longer making its manufacture an application as widely known as possible.

Numerous attempts have been made by previous workers in this direction to produce a cheap gas for heating purposes, by the action of water vapor on incandescent carbon.

It has long been known that if steam be passed over coke or charcoal heated to redness, a decomposition of the steam takes place, hydrogen (H), carbonic oxide (CO), carbonic anhydride (CO_2), and a small proportion of marsh gas (CH_4) being produced.

The composition per cent. by volume of the mixed gas produced in this way is, according to Langlois' analysis—

H=54·52 CO=31·86 CO_2=12 CH_4=1·62

According to Frankland's—

H=56·9 CO=29·3 CO_2=13·8

It is evident, therefore, from these analyses, that we have here a very important heating gas, could we succeed in producing it in considerable quantities economically. How to do this most effectually has formed the subject-matter of numerous patents. It is not my intention to enter into a discussion on the relative merits and demerits of the various processes proposed in these patents, any such course indeed being rendered unnecessary by the fact that very few of them have been commercially a success. The cause of this want of success is not, I think, far to seek; the apparatus devised for carrying out the process being for the most part large and costly, and rarely complete in itself, or what one may term self-contained—that is to say, in addition to the actual retort or generator in which the gas is produced, a special boiler and superheater are required for generating and superheating the steam used in the process, and in most cases the retort or generator requires to be set in a furnace and heated by a special fire, in the same way as an ordinary gas retort. Or, if this course be not adopted, and only one fire used, viz., that in the generator itself, then a special blowing apparatus becomes necessary, and the production of gas is intermittent instead of continuous, for steam and air have to be urged in succession through the same column of fuel, and it is only when the steam jet is in action that gas is produced, the air blast being employed to blow up and revive the fire, the temperature of which is much reduced by the passage and decomposition of the steam.

I think it must be abundantly clear that these extra pieces of machinery and additional processes add very materially to the cost of erecting and working the apparatus, and also to the price of the gas produced, which, taken in connection with the large space occupied by the complete apparatus, entirely prevents it from coming into general use for small manufacturing and domestic purposes, thus shutting it out from what I conceive to be one of its widest and most important applications.

The generator consists of a hollow cylindrical body or case, made for convenience, at present, of wrought or cast iron, but which ultimately may be constructed of other materials. This cylinder is terminated below by a cast-iron bottom, having a hole in its centre about one-half or one-third its own diameter; below this again, and forming part of the bottom casting, is a second hollow cylinder of the same internal diameter as the hole above it; in this lower cylinder the fire-grate is lodged; the blast-pipe opening into it below the fire-grate. The grate fits the cylinder loosely, and is attached to it on one side by means of a hinge, the other side being supported, when in position, by a pin screwed through the cylinder; this arrangement permits the grate to be readily moved up and down, and facilitates the withdrawal of the charge when necessary.

When making gas the bottom of the small cylinder requires to be closed air-tight. This is effected either by means of a flat hinged plate, which is kept tightly pressed against it by a heavily weighted lever, or else by a short cap with a bevelled edge attached to it by a bayonet-joint. In the upper and larger cylinder there is a coil of thick wrought iron pipe, which fits the cylinder pretty closely, and is attached to it by means of a series of brackets or supports, which prevent the coil from collapsing of its own weight. At the bottom the coil is protected from the intense heat of the fire by a thin lining of gannister. The two ends of the coil are turned outwards at right angles, and pass gas-tight through the body of the generator; the lower end is connected with an arrangement for supplying water under pressure, and the upper end with a steam pipe of smaller diameter, which passes down parallel to the generator, and terminates in a small steam tap immediately in front of the blast-pipe.

The top of the apparatus is a casting of rather peculiar shape. In its centre there is a circular opening about nine inches in diameter, communicating below with a hollow inverted truncated cone projecting into the interior of the generator. At the apex of the cone there is a narrow cylindrical ring, which serves as the seat for a heavy conical valve, which fits it gas-tight. Above, this is surmounted by a short cylindrical fuel box, carrying at its upper end a hopper, the opening between them being covered by an ordinary flat sliding plate or valve. Attached to the fuel box there is a short flue, used when lighting the fire, but closed when making gas. In addition to the central opening in the cover of the apparatus, there are two smaller ones; the larger of these being the gas outlet, and the smaller a peep or stoke-hole; this is closed, when not in use, by a gas-tight cap or plug. The whole apparatus is supported on three legs, attached to the flat underside of the bottom casting.

Presuming I have succeeded in making the construction of the gas producer intelligible, it will, I think, be readily seen that, if a fire be lighted in the interior, and water driven through the coil, that water will be rapidly caused to boil, steam will be produced, which will accumulate in the upper part of the coil, and, if not immediately allowed to escape, will take up a further increment of heat, and pass into the condition of superheated steam. If now the tap in front of the blast-pipe be opened, this superheated steam will pass down the small pipe outside the generator and blow with considerable force into the blast-pipe, carrying with it, by its inductive action, a stream of air. By properly apportioning the size of the steam jet to the internal diameter of the coil, a constant supply of superheated steam is obtained, and, as a matter of course, a continuous blast of air ensured. In this way, then, the requisite oxygen to support combustion, and steam for decomposition, are driven into the apparatus with considerable force, from which, after traversing the column of heated fuel, they issue as a permanent gas.

Before, however, tracing the mixture in its upward course through the fire, it will, perhaps, be as well to describe the mode of working the apparatus, in order that you may see how very simple the operation really is. For this purpose, I will assume that the generator is empty.

Before lighting the fire, I shut the valve in the gas main, open that at the bottom of the ash-box, lift the conical valve off its seat by means of the lever handle outside the fuel-box, close the steam tap, and open the water-cock, so that I start, in fact, with the coil full of water, and the interior of generator in free communication with the chimney. The fire is lighted in the ordinary way, the necessary coal, wood, etc., being charged in through the hopper; a light is applied to it from below the fire-grate, and the chimney draught draws up the fire in the same way as in a common closed stove. When the fire burns briskly up, as it generally does in about a quarter of an hour after lighting, unless it be fed too fast or otherwise checked, superheated steam will be abundantly produced. The steam tap may now be slightly opened, the valve at the bottom of the ash-box closed, and the fire more rapidly blown up by the steam blast, the jet being gradually opened as the intensity and body of the fire increases, until the full blast is given. In charging the apparatus with fuel, it is advisable not to use

large lumps, nor—especially at first—to feed it too fast, otherwise an injurious lowering of the temperature in the upper part of the generator is likely to take place, and wet instead of superheated steam comes over. By a judicious use of the peep-hole this may entirely be prevented, as new fuel should only be added when the upper part of that already in the generator begins to appear red-hot. The charge of fuel is put in the hopper and the sliding plate withdrawn; this allows the fuel to fall into the cylindrical box beneath, and if the conical valve be up it passes direct to the generator; if, on the other hand, this valve be down—as is always the case when making gas for use—it falls upon and around the valve, and remains in the fuel box till this valve be lifted, which, of course, should not be done before replacing the sliding-plate between the hopper and the fuel-box. This mode of charging prevents any escape of gas into the room, and admits of the apparatus being fed as often as may be necessary while making gas.

When the generator becomes about one-third to one-half full of fuel, good gas will be abundantly produced, which may be turned at once into the gas main. To do this, it is only necessary to drop the conical valve on its seat, and open the gas outlet, when, the communication with the chimney being cut off, the gas passes directly to the pipes and apparatus connected therewith.

The water is supplied to the coil under pressure. The necessary pressure may easily be obtained in either of two ways—viz., by a cistern placed at a sufficient height above the generator, or by a small accumulator standing alongside it, and provided with a hand force-pump and gauge. The latter plan is much to be preferred, as it enables the pressure to be altered at will, and brings the whole process well under control. For this purpose only a very small accumulator is necessary, and the amount of extra work thus thrown on the attendant is almost nominal. For instance, I have worked a generator producing about 4,000 cubic feet of gas per hour with an accumulator only two feet high by nine inches in diameter, and I found, even with so high a pressure as 60 lbs. on the square inch, a few strokes of the pump every quarter of an hour or so was all that was required to keep up the pressure and supply the coil with water. The accumulator we employ consists simply of a hollow cylindrical vessel provided with a force-pump and gauge, and containing air, by the compression of which any desired pressure may be obtained, from 1 or 2 lbs. to 100 lbs. on the square inch; it acts, therefore, on exactly the same principle as the air vessel of a pumping-engine.

Here I would call your attention to the absolute safety of this method of working, and to the impossibility of bursting tde coil, even should a stoppage occur in it. The only thing that could happen in such a case as this is, that the water and steam in the lower part of the coil would, when the pressure rose high enough, be driven back into the accumulator, where the steam would be instantly condensed in the cold water, which it would barely warm, as the quantity of steam in the coil, compared with the quantity of water in the accumulator, is extremely small. This arrangement, therefore, acts as a most perfect safety valve, and prevents the steam pressure from ever rising sensibly above the ordinary working pressure.

Now, as we have seen, the air blast is set up and maintained by the inductive action of the jet of superheated steam playing into a small tube or blast-pipe, which opens into the cylindrical ash-box beneath the fire-grate. The intensity of this blast, therefore, will manifestly depend upon the water pressure in the accumulator, and as the force with which the gas issues from the generator will clearly be proportional to the strength of the blast, the whole admits of easy adjustment, to meet the varying conditions of pressure and resistance which the gas may have to overcome. With respect to the actual gas pressure obtainable in this way, I found experimentally that, with a water pressure in the accumulator of 15 lbs., on the square inch, I obtained a gas-pressure in the generator of over one inch of water, and with a water pressure of 40 lbs. on the square inch, the corresponding gas-pressure in the generstor was two and one-half inches of water. This latter is considered to be a good average working pressure.

The fire bars are kept cool by the steam and air passing between them, and are thus prevented from rapidly burning or oxidising away.

The chemical reactions which occur in the generator I take to be very simple. Carbonic anhydride (CO_2) is doubtless first formed by the action of the oxygen of the air upon the carbon of the fuel; this in its passage upward through the heated fuel takes up another equivalent of carbon becoming reduced to carbonic oxide, CO, thus—

$$CO_2+C=2CO,$$

the nitrogen of course passing off unchanged and serving only to dilute the gas. With respect to the steam, this, as explained above, is decomposed in its passage over the incandescent coal with the formation of hydrogen, carbon-monoxide and carbonic-anhydride. The latter in its upward course sharing the same fate as CO_2, produced by the action of the oxygen of the air, *i. e.*, it takes up another atom of C, and passes into the state of CO. The decomposition, therefore, of the steam adds materially to the calorific value of the gas, by enriching it with hydrogen, and a further quantity of CO.

The composition of the gas produced by this generator, when working at different pressures of water, and with various kinds of fuel, has been determined by analysis. The result is as follows:—

As regards the quantity of mixed gases produced from a given quality of fuel, this has been ascertained experimentally in the most careful manner, every precaution being taken to eliminate all sources of error. The gas from the generator was first passed through about 100 feet of 3-inch pipe, more than 50 feet of which was out in the open air, and then through a large meter.

Before reaching the meter, therefore, the temperature of the gas had been reduced to about 60° or 70° Fahr.

The following are the results:

Description of fuel.	Water pressure in lbs. per sq. in.	Cu. ft. of gas per lb. of fuel
1. Anthracite	15	69·5
2. Equal parts of anthracite and steam coal	20	85·2
3. Equal parts of anthracite and steam coal	25	88·84
4. Equal parts of anthracite and steam coal	30	94·5
5. Anthracite	40	(over) 100·00

It will be seen, therefore, that there is a steady increase in the quantity of gas produced per lb. of fuel consumed, as the water pressure rises from 15 lbs. to 40 lbs. Beyond this point there does not appear to be much advantage gained by still further increasing the pressure, at least this is the case in the smaller size generators, with which hitherto most of the experiments have been made. I confess it is somewhat difficult to account for the increased yield of gas at the higher pressures, as of course no one pretends to be able to obtain more than a certain definite quantity of carbonic oxide and carbonic anhydride by the oxidation of a given quantity of carbon. I think, however, it may be due in part to two causes. At the higher water pressures the force of the steam jet is proportionally incrersed, consequently a larger volume of steam and air is injected into the apparatus in a given time. This gives rise to a more intense combustion of the fuel, which is, I believe, at the same time more perfect combustion, and it is to this cause and the fact that that a larger volume of steam is simultaneously decomposed, that we must attribute the increased yield of gas.

After making numerous trials of different kinds of fuel, the conclusion arrived at, is that although a variety of non-caking fuels, such as coke, wood-charcoal, peat-charcoal, steam coal, etc., may be used, yet, on the whole, anthracite coal gives the best results, and is much to be preferred for use with the apparatus.

It might be thought that tying it down in this way, to the use of one particular class of fuel, would very much tend to restrict the use of the apparatus, and practically shut it out from competition for steam boiler purposes, especially on board ship. I do not, however, think this will prove to be the case. We have vast stores of anthracite coal both in Wales and Ireland, at present almost unworked, and waiting to be developed, only a very small quantity being now raised for copper smelting, and a few minor purposes. So also in British Columbia, Vancouver's Island, and many other of our insular possessions, there are great quantities of this fuel lying practically useless, because as yet no practicable method of burning it economically in our ordinary furnaces has been discovered; indeed it has been stated that at some of these places we have been obliged to establish coaling stations, and carry to them ordinary bituminous coal for the use of our steam ships, because our boiler furnaces are not adapted to burn the fuel already on the ground.

The use of what has been termed anthracite coke in marine boilers was advocated in a paper read last summer before the United Service Insti-

Description of fuel.	Pressure of water.	Composition pr. ct. by volume of gas.	
	Square inch.		
Peat charcoal	15 lbs.	CO = 28·6 H = 14·6 CO_2 = 4·0 N = 53·0	100·2
Anthracite	15 lbs.	CO = 22·6 H = 10·0 CH_4 = 4·9 CO_2 = 4·5 N = 58·0	100·0
Equal parts of anthracite and steam coal	30 lbs.	CO = 28·3 H = 9·3 CH_4 = 5·2 CO_2 = 6·2 N = 51·3	100·3
Anthracite	60 lbs.	CO = 26·4 H = 13·5 CH_4 = 1·4 CO_2 = 3·9 N = 54·8	100·0

tution, by Captain Geary, R. A., in which he states that, by the use of this kind of fuel, burnt under blast in a specially constructed furnace, quite separate and distinct from the ordinary boiler furnace, or in what is practically a gas generator, somewhat resembling the one I have described, he got a result which was superior as regards fuel consumed, and the speed of producing a certain effect, to a similar boiler fired in the ordinary way, in the proportion of 6·8 to 1.

In the discussion which followed the reading of this paper, the desirability of devising some means of utilising anthracite for steam navigation purposes was insisted on by nearly every speaker, and the subject still excites considerable attention among naval architects and engineers.

I venture, therefore, to think that this apparatus is a step in the right direction.

Of all the proposed methods for generating a cheap heating gas, either for domestic or manufacturing purposes, the only one, so far as I know, that has hitherto met with much success, is the process patented by Siemens. This is now extensively used in the manufacture of iron, steel, glass, etc., both in this and other countries. It will perhaps, be worth while, therefore, to institute a comparison between the quantity and quality of gas produced by this process and the one I am describing.

In Percy's "Metallurgy," vol. i., p. 528, the composition per cent. by volume of the gas produced by a set of Siemens' generators in work at St. Gobain, France, is set down as—

Hydrogen	=	4 to 11 per cent.
Carbonic oxide	=15 " 19	"
Carbonic acid	= 6 " 7	"
Nitrogen	=75 " 63	"

The first two of these constituents, or from 19 to 30 per cent., are alone of any use as fuel.

Turning now to the analysis of our gas given above, I find that the inflammable constituents stand in the proportion of from 37·5 to 43·2 per cent. The gas produced by this method, therefore, is much richer in heat-producing material than the gas produced by Siemens' method, and of course its calorific value is proportionally increased.

With regard to the respective quantities of gas produced by a given consumption of fuel in the two processes, I find Dr. Percy estimates that one ton of coal exclusive of earthy matter or ash is capable, when treated in the Siemens generator, of producing about 50,000 cubic feet of gas at 15° C.

The records of the experiments made with this apparatus, and of which I gave a brief epitome above, show that one ton of fuel treated in it, yields from 155,680 to 224,000 cubic feet of gas; that is, from 3 to 4½ times the quantity yielded by the Siemens process. This gas, therefore, is both richer in quality, and produced in much larger quantity than Siemens; a fact which, if it stood alone, ought to be sufficient to prove the great practical value of the invention.

There is, however one other point to which I would for a moment direct attention. Siemens' generators are large and costly, and the space occupied by the complete apparatus is very considerable; they are therefore only applicable to large manufacturing and metallurgical processes, such as those enumerated above, and are in nowise adapted for making gas for smaller works or private establishments.

On the other hand, these generators can be made almost of any size, either small or large, so that they are eminently adapted for use in small manufactories, such as chemical works, potteries, foundries, forges, drying processes, etc., where cleanliness, economy of fuel, absence of smoke, and simple regulation of temperature are required. Further, it is believed that the comparatively small cost of the apparatus, and the ease and facility with which it is put into operation, renders it peculiarly fitted for making gas for domestic purposes. The use of gas as fuel is beginning now to be more generally understood and appreciated, and it is pretty readily admitted that, for cooking purposes at least, it is nearly as economical to employ gas as coal, with the advantage that it is much cleaner—there is no dirt, dust, or soot—and the saving in labor alone is very great. In addition, it has been clearly shown that the waste of of meat when cooked by gas is from 10 to 15 per cent. less than when cooked in the ordinary way. At the London Hospital it has been estimated that a saving of £400 a year has been effected by substituting cooking by gas for cooking by coal; and a large employer of labor, on whose premises the cooking is done daily for about 1200 people, states that he is saving something like £800 a year in a similar way.

Of course, at both these establishments, ordinary street lighting gas is the fuel employed, and the burner used is that invented by Bunsen, and generally known by his name. The peculiarity of this burner consists in mixing air with the gas before it is consumed. Under these circumstances the gas burns with a blue, lightless flame, and there is no deposition of soot or carbonaceous matter; the gas is, in fact, perfectly burnt, the sole products of combustion being water and carbonic anhydride, or, as it is more generally termed, carbonic acid.

The gas produced by these generators is essentially a non-luminous gas. When taken direct from the producer, it burns with a reddish blue flame. After having, however, been stored in a gasholder for a few hours in contact with water, the flame loses this red tinge, and the gas burns with a blue, lightless flame very much resembling ordinary gas burnt in the Bunsen burner. In neither case is there any smoke, soot, or deposit of any kind by the burning gas, the sole products of combustion being water and carbonic anhydride. It is unnecessary, therefore, to mix air with this gas before it is burnt, as there is no luminosity to be destroyed, or deposition of carbonaceous matter to be prevented.

On the table there are two gas-burners; one is a Bunsen burner of the ordinary construction, connected by a piece of tubing with the street gas supply; the other is simply a bent tube, somewhat resembling the Bunsen in shape, but having no holds at its base for the admission of air; this burner I will connect by a piece of flexible tube with a small holder in which a quantity of the heating gas has been stored for hours. Both burners are now in action, and you see there is a marked resemblance between the two flames.

Of course, notwithstanding this similarity, there is a considerable difference in the calorific power of the two gases. Very careful trials show that it requires about five times the bulk of this gas, as of ordinary lighting gas, to heat a given quantity of water through a certain number of degrees.

But this comparison only holds good when the two gases are burnt in the open air. The ordinary ring burner, which appears to be tolerably well adapted for use with common lighting gas, is not in any way an advantageous form of burner for our heating gas, but as the manufacture of special means is always an incumbrance to the application of any novelty, I think I am best recommending its use by showing you what our gas can do with the ordinary applications in use.

We have ample evidence in every direction experimented on, that the greatest development of heating power is obtained when the gas is burned in what may be termed "partial confinement," or with the jets so enclosed, that the air entering to support combustion is capable of being easily and accurately adjusted. As, however, this point remains to be more fully worked out, we will not take it at all into account in forming an estimate of the comparative cost of doing a given amount of work by the two kinds of gas, but will assume, as the basis of our calculations, that one cubic foot of coal gas is equivalent in heat-giving power to five cubic feet of the heating gas.

A No. 1 generator will produce on an average 1,000 cubic feet of gas per hour, and consume about 10 lbs. of coal; taking a working day of 10 hours, the consumption of coal will be about 1 cwt., and the gas produced, 10,000 cubic feet.

The cost of the 10,000 cubic feet of gas will be as follows:

	s.	d.
1 cwt. of anthracite	1	6
Wages of attendant	4	0
Ordinary coal and wood used in lighting the fire	0	4
	5	3

The cost of the 2,000 feet of lighting gas required to do an equivalent amount of work is from 7s. to 8s.

With the larger size generators the saving is still more marked. A No. 2 generator consumes about 35 lbs. of coal an hour, and produces 3,500 cubic feet of gas an hour. The cost of the 35,000 cubic feet of gas produced in a working day of 10 hours, is as follows:

	s.	d.
3½ cwt. of anthracite	3	6
Wages of attendant	4	0
Ordinary coal and wood used in lighting the fire	0	4
Total	7	10

In heating power this would be equal to 7,000 cubic feet of ordinary London gas, costing from 24s. 6d. to 28s. It is, therefore, manifest that where the consumption of gas is considerable, a most important saving is effected by using the larger size apparatus.

I think, however, it is only fair to say that when working the No. 1 generator the attendant's time is by no means fully occupied; indeed, in some experiments I made with the apparatus, lasting over several weeks, one man attended to three of them with the greatest ease.

The cost of the application of this gas for large establishments will depend on the rate, and the varying quantity of the consumption; if this be constant and continuous, it is not absolutely necessary to introduce even a pressure regulator between the generator and supply pipes, as the gas can be carried direct to the cooking and heating apparatus and there consumed. The only advantage gained in such a case as this, by the use of a governor, is that the pressure in the main is kept constant while charging the generator with fuel.

If, however, the gas cannot be usefully consumed as fast as it is generated, then it becomes necessary to employ a holder and to store the gas in the ordinary way. For this purpose any common gasometer may be used, no specially constructed holder being required.

The gas can be sent direct from the generator to the holder, without passing it through a scrubber or other apparatus for washing or cleaning it, as there are no tarry or ammoniacal products to be condensed or removed. Also the pressure under which it is produced is sufficient to overcome a resistance measured by a column of water two inches in height, and this, in a common gasholder, is amply sufficient for most purposes; no adjustment of the weights, therefore, every time the boiler is filled, becomes necessary.

[To be continued.]

THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY

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MONDAY, JUNE 3, 1878.

Official Report of Examinations of Gas for two Weeks ending May 25, 1878, made at the Photometrical Room of the Department of Public Works.

Corrected Illuminating Power.

Date. April, 1878.	Time of Day at which Test were made.	New York Gas Light Co.	Manhattan Gas-Light Co.	Mutual Gas-Light Co.	Metropolitan Gas-Light Co.	Harlem Gas-Light Co.	Municipal Gas-Light Co.
May, 13	Between 10 A. M. and 3 P. M.	15.97	17.28	19.26	17.53	16.22	
14		16.40	18.12	18.68	16.70	16.18	
15		17.30	18.43	20.47	16.88	16.38	
16		15.07	19.51	20.65	16.80	16.45	
17		15.87	17.86	19.92	16.54	16.14	
18		15.79	17.46	19.74	16.23	16.17	
	Average	16.06	18.11	19.78	16.78	16.25	
20		16.89	18.06	19.80	16.73	16.27	
21		16.92	17.18	18.13	16.68	17.21	
22		16.76	17.36	18.43	16.57	18.87	
23		17.63	17.34	19.35	16.64	18.16	
24		17.03	17.91	18.56	16.00	17.97	
25		16.52	16.65	19.16	16.30	18.65	
	Average	16.95	17.41	18.90	16.48	17.85	

Sugg-Letheby burner.

E. G. LOVE, Gas Examiner.

Metropolitan Gas-Light Company of New York City.—The bonded debt of this company, amounting to $500,000, is now being paid off out of the nett earnings of the company.

Competition Between Coal and Naphtha Companies in Brooklyn.

The Brooklyn *Eagle* of May 14th, speaks editorially as follows:

LIGHTING THE STREETS.

When gas sold for $2 per thousand cubic feet it cost the city of Brooklyn about $600,000 per annum to light the streets of the city. By diminishing the number of lamps on the less frequented streets, and by a reduction in the price of gas, the cost of street light has been brought down to about $425,500 per annum. The city makes two kinds of contracts—one at so much per foot for the public buildings, and the other at so much per lamp for the streets, the size of the burner, the pressure, and the hours of illumination being specified in the latter case. The contract now about to expire was $30.25 per lamp, and $2.25 per thousand cubic feet for the gas supplied to the buildings. On Friday last, bids to run for the next eight months were received from the various companies. There is really no competition between tha companies, for each has a district of its own, and bids only for that district. They are controlled by other considerations, such as the fear of competition in the future, the chance of hostile legislation, and the possible curtailment of the demand for their commodity in case their prices are deemed exoorbitant. Thus it happens that the bids put in are lower than ever before. The Brooklyn Gas-Light Company offers to light the buildings in its district at $2.15 per thousand feet, and the lamps at the rate of $28 per annum, while the other companies having more sparcely settled districts, want $29 per lamp, though for the gas supplied to buildings they offer to take $2 15 per thousand feet. This is not a very large reduction, but it will in the aggregate amount to a saving of about $20,000 to the city. Whether or not the companies cannot fairly be called upon to supply the city with gas at the rate of $2 per thousand feet is a question which we do not care to answer off hand, but it can, we think, easily be shown that the difficulties which stand in the way of supplying gas at that price do not spring from any normal restriction on the work. Paradoxical as the statement may appear Brooklyn is suffering because there are too many gas companies. They owe their existence to what was termed the spirit of competition. They simply provad efficient in getting far more capital sunk in works and mains than the demand for gas could possibly justify.

Pending the acceptance or modification of the bids in question, a discussion of a somewhat amusing nature sook place in the Common Council Chamber yesterday. It seems that in Williamsburgh some of our more enterprising politicians have established a corporation for the manufacture of what they call naphtha gas. Naturally enough, these gentlemen are more impressed with the value of their own commodity than are the politicians who are interested in the Mutual Gas Company, and hence there is a certain asperity of feeling between them. The naphtha men want to light Williamsburgh, or at least a part of it, at a cheaper rate than the regular gas can be obtained for. Honest John French headed the naphtha movement, and was judiciously seconded by Mr. Fisher Ray, whose especial business appears to be to sneeze whenever Jourdan takes snuff, and who has, from the beginning until now, been up to the neck in the Mutual Gas job, took very strong ground against the naphtha men. Honest John had no difficulty in showing that naphtha would be cheaper than the gas at present furnished. Indeed he could have shown with equal cogency that the moon, though somewhat fickle, has, in point of economy, a marked advantage over even naphtha. The bold Ray, however, was not to be caught with such chaff as he had himself used in the past. If naphtha was good for Williamsburgh why was it not equally good for Honest John's district? Why should the benign beams of this new political illuminator be withheld from the various wards of the Western District? Mr. Ray, of course, was in favor of reform in gas. He could not conceal from himself that the existing companies were grievous monopolies. He had, he would remind his associates, allied himself with the Mutual Company, to the end that relief might be obtained, Yet, ah, yet, he could not assent to the introduction of naphtha in the Eastern District.

Honest John was helped out of this hole by Mr. Fisher, who remarked that Mr. Ray seemed to be very much in favor of naphtha where it could not be supplied, and decidedly against it where the works for its manufacture were established. In the way of sham ardor for the dear public, yesterday's discussion is one of the finest things produced for many months past by our Aldermen. It is better than the Mutual gas debate, inasmuch as it brought out the fact that the Mutual gas man in his own inimitable way is as anxious to "keep the ring small" as any of the venerable Bourbons who ever operated in the light produced from coal.

Seriously, it does not appear that this naphtha proposition is entitled to much consideration. If mere cheapness is to guide the city in this matter, we can do better with kerosene than with naphtha, and if cheapness is not the only consideration, the qualities of regular gas preclude the naphtha men from competition. Upon the whole, Brooklyn has had quite as much gas from politicians as it will want for many a day. They have succeeded in impoverishing hundreds of respectable honest families, by their raids upon the existing companies.

PROCEEDINGS IN THE BOARD OF ALDERMAN, MAY 13TH.

A regular meeting of the Board of Aldermen was held at two o'clock yesterday afternoon, Francis B. Fisher, Esq., President, in the chair.

The minutes of the last meeting was read and approved.

THE GAS CONTRACTS.

A communication was received from the Board of City Works, inclosing the proposals of the different gas companies for furnishing gas for the street lamps and the public buildings.

Alderman French—This matter has been before this Board in various forms, and now comes to us by way of proposals for the balance of the year. The committee presented to the Board the result of their investigation in the matter, and also reported to the Board the result of the communication with the various gas companies, and this Board authorized the Board of City Works to readvertize for proposals for lighting the public lamps and the public buildings, and the result is now before you. I am vary glad to say that the result, though not as satisfactory as the nommittee desired, will yet materially lighten the burdens of the taxpayers. There will be a saving of $19,615.38 effected. The members of the Board will see that one of the proposals given in this communication states that they will light a certain district of the city with naphtha gas, which, if adopted, will make a further saving of $9,754.70, that is for the seven months. The Naphtha Gas Company, and by the way, gentlemen of the Board will see an illustration of what naphtha will do, I call attention to the lamp now lighted near the door. It seems to me it is as good as anything we have in Brooklyn. They will not be able to light the whole district before the end of thirty days, and if you use naphtha gas in the Williamsburgh district it will make a total saving of $26,370.08. It is certainly worth attention at this time, when taxpayers are so burdened that they find it hard to pay their bills. Last year this same company received permission from the New York authorities to light 2000 lamps in what is known as the Harlem district. I made inquiries as to the satisfactory issue of that experiment, and I was told there were no complaints whatever, except one, and that was made by an officer of one of the other gas companies. Something will be said because it is not spread over the whole city, but I am not responsible for that. I would be willing that some of the lamps in the Twentieth ward should be lighted in this manner, for we can save the taxpayers a large amount of money by

substituting what is called naphtha gas for coal gas. The company has the very best recommendations, and it can give the very best sureties, but I don't wish to say anything further on that subject than to offer a resolution to bring the matter before the Board:

Resolved, That the contract for furnishing gas or other illuminating material for the street lamps, and for lighting, extinguishing, cleaning and repairing said street lamps in the district heretofore lighted by the Williamsburgh Gas Light Co. be and the same hereby is awarded to the New York and New Jersey Globe Gas-Light Company, of which John W. Cole is agent, at the price set forth in their proposal, publicly opened and announced on May 16, and the Board of City Works are hereby directed to cause a contract to be prepared and executed therefor in accordance with the specifications on file in the Board of City Works.

Alderman Griswold—I would like to ask the gentleman from the Twentieth ward a question or two, in order that we may start right. As I understand it these bids range at $10 for the balance of the year?

Alderman French—Yes, sir.

Alderman Griswold—At what rate is that for the year?

Alderman French—$28.50, sir. Last year we paid $30.25, now we are paying $28.50.

Alderman Griswold—According to the bid of the Naphtha Company for this one district, there will be a saving of $9,754 for the seven months?

Alderman French—Yes, sir.

Alderman Griswold—I might say I certainly think the gas companies are a monopoly. I do think they have taxed the people too much for gas, and I think there should be some severe steps taken to reduce the price, because from what information I have the stock of these companies must have been a most profitable investment, and I think the time has come when these companies should be made to feel that the people have rights which they are bound to respect. I don't know enough about this naphtha to say whether I would be willing to have my ward lighted with it.

Alderman Ray—During the five weeks I have been a member of this Board, the proposition has come up regularly every year to devise some means to lessen the price of gas. As yet it has not resulted in anything. The year before I came in here, there was a committee sent to Philadelphia to inspect the Municipal Gas Works there, and they came back here to recommend that the city should manufacture its own gas. About that time the city of New York and the city of Brooklyn were in a similar condition; they were paying $40 per lamp. Now New York pays $12 and we are paying at the rate of $37 for a four foot burner. All the saving we have made so far, we have made out of the pockets of the people themselves. In 1875, the political party that was dominent then, knowing it would not be dominant the next year, was generous enough to take $100,000 off the gas account, and the Board of Aldermen reduced the size of the burners from four feet to three feet, and at the end of the year we had a balance in the treasury to the credit of the gas account, but we did not make it out of the companies, we made it out of the people. New York applied to the Legislature, for the gas companies of that city stood as the companies of Brooklyn stood—solid. The New York companies were wrecked, and the new companies that were started broke down the monopoly, and now they are getting their gas at a little over cost, but Brooklyn is standing still and meekly talking. Two years ago there was a proposition made to break down the monopoly in this city, and opposition was immediately made to it. The Mutual Gas-Light Company applied to this Board for a charter, and for permission to lay their pipes, and the proposition met with opposition, not only from the old gas companies and the authorities, but also from some of our best citizens, I am sorry to say, who were interestnd in these old companies. They crowded the Mayor's office from morning till night in opposition to the new company. Not only that but a part of the press opposed it, although they knew very well, Mr. President, that the only way to break down this monopoly was to allow new companies to go to work and lay down their pipes. They have not ceased their opposition. They have worked in the same direction all winter in the Legislature to protect this monopoly, and to prevent the company laying its pipes. Another proposition is made to reduce the cost, and as usual, it is to be done at the expense of the people and not of the companies. In the district where the ward lies that I have the honor to represent, it is proposed to light the lamps with naphtha gas. I don't know anything against it. But why should they select this district? I have heard no reason assigned for that, and I am forced to the conclusion that they asked parties who were interested, which was the best district to bid for. Now, if this naphtha gas is such a good thing, we in the Eastern District are inclined to be generous and to let the people in other sections of the city share in the benefit. We would like all the people to have some of it, for if it is such a good thing, and such an economical thing, why should the people of the Eastern District have it all? Now, in order that others may share in this good thing, I have prepared the following resolution:

Resolved, That the Board of City Works be, and hereby is, directed to enter into contract with the New York and New Jersey Globe Gas-Light Company, to light, extinguish, clean and repair five hundaed lamps in each of the districts controlled respectively by the Brooklyn, Citizens, Metropolitan, Nassau and People's Gas-Light Companies, at the terms of their bid now before the Board for lighting the lamps now lighted by the Williamsburgh Gas-Light Company.

If the gentlemen who have advocated this measure are earnest, are sincere, and are acting for the welfare of the city of Brooklyn, they will accept this amendment.

Alderman Fisher—The gentleman has hardly done justice to the Lamp and Gas Committee of the Board of Aldermen of previous years, in stating that all the reductions have been made at the expense of the people and not at the expense of the companies. To be sure the three feet burners are at the expense of the people, but the twenty-five cents taken off last year was at the expense of the companies, and contributed very largely the saving that was effected. I can sympathise with the people of the Eastern District on the innovation being made in their district, and they may think it hardly fair. But we have to view this matter in all its phases. It is a matter of large expenditure, but it is very much less now than it was only a comparatively short time ago, and our desire is to make still less. I had the honor to appear before the representatives of the gas companies, and we then ascertained that they had no disposition to meet the wishes of the people in the matter of reducing the price, and it was not until it came within their vision the prospect of rivalry that they manifested a disposition to hear us at all, and the most arrogant and most supercilious of all those companies has been the Williamsburgh Gas Light Company, It required but very little sagacity on the part of these gentlemen who desired to bid to ask where it would be best to go, and it required very little wisdom to select the district of the Williamsburgh Gas-Light Company. If I am not misinformed they charge more to private consumers than any other company. It is a monopoly grasping, avaricious, and over reaching, and I hope I may be able to say that in this instance at least, it has overreached itself. I hope this proposition is but the entering wedge which will enable the citizens of Brooklyn to enjoy the same advantages which the people of New York enjoy to-day, and that we shall come down from $37 to $12. This light may not be perfect in all respects, but if it has been good enough to burn for nine months in the city of New York, it is good enough for us to try, and if this light were good for nothing, and if the people of Williamsburgh walked in partial darkness from now until the end of December, it would be better for the people of the city of Brooklyn if its use should result in breaking up this monopoly. There is no other way at present of checking this gigantic monopoly, for who believes the bid of $19 would have been made except for that light?

Alderman Ray said the people of the Eastern District did not care to have the gas companies thrashed over their shoulders, and did not desire to have a bad article, even though the use of it was to benefit other portions of the city. He was satisfied that the Williamsburgh was a grasping company, but it was part of the Union. If there was any fault to find with one company it ought to be found with the others also. The Brooklyn had paid a dividend of 96 per cent. and the property represented by all the companies was said to be worth nearly fifteen million of dollars.

Alderman French explained why the Naphtha Gas Light Company had bid for the Williamsburgh district and no other, was because the works where they prepared the oil were situated in that district.

Alderman Ormsbee agreed with what had been said by the gentleman from the Thirteenth ward, and did not see why the people of the Eastern District should be condemned to walk in darkness, even though the people at large will be benefitted.

Alderman Dwyer was not sufficiently posted to speak intelligibly on the subject, and thought it would be better to have it laid over for a week.

Alderman O'Reilly did not think it would be wise to push the matter forward with sudden haste: if that was done he should become a little suspicious. The Naphtha Gas Company might be a very good thing in its way, but there was such a thing as its being bought up by the old company. He thought the suggestion made by the gentleman from the Second ward was a good one, and therefore moved to lay the matter over for one week.

Alderman Murtha was sorry the discussion had been turned into a matter of one district against another. Having been a member of the Gas Committee of 1877, he could only say that the most strenuous opponent against the reduction of one cent was the Williamsburgh Gas Company, which up to the last moment was indisposed to make any reduction whatever. He thought from the shape the question had assumed, that the cost of lighting the street should be borne by the different wards, and not made a general charge on the city at large.

In answer to a question from Alderman O'Reilly the President said the name of the bidder for the Naphtha Gas Company was John W. Coe, and the sureties were Charles Pratt and Leonard Richardson.

Alderman O'Reilly did not see how a delay of one week would interfere with the proposals in any way, He did not know why any objection should be made to laying the matter over.

Alderman French said the objection was that it would cost the city $64 a day to lay it over.

Alderman Murtha moved to amend by making it the special order for next Monday.

Alderman O'Reilly accepted the amendment, and, as amended, the motion to lay over was carried by the following vote:

Affirmative—Aldermen Dwyer, Aitken, Kane, Phillips, McIntyre, Murtha, Gunder, Griswold, O'Reilly, Ormsbee, Petty, Cottrell, Williams—13.

Negative—Burnett, Black, Ray, Baird, French, Duane, Fritz, Fisher, Drayer, Easton—10.

The whole question of awarding the gas contracts was then laid over until next Monday.

THE MUTUAL GAS JOB BURIED.

The history of the notorious Mutual Gas combination has been made familiar to every person who can read, and who feels interested in Brooklyn affairs. A more scandalous abuse of municipal authority has never been known in this city, than was perpetrated when our Board of Aldermen and Mayor Schroeder combined to give to a gang of needy, adventurous, unscrupulous politicians, a charter to build or not to build, to sell or not to sell, at their pleasure, certain gas works, in whatever part of the city they deemed

proper, with the accompanying power to tear up any of the streets of Brooklyn without restriction. No charter so comprehensive in its powers was ever before granted to any Brooklyn corporation; no grant at all resembling it was ever made with so little of pretended justification on grounds of public policy. Every alderman who voted for the charter knew that the men to whom it was given had no money to invest in the proposed enterprise, and must therefore have known that the only purpose of the incorporators was to obtain, without cost, but at the expense of Brooklyn, a power which might either be disposed of at a considerable price to outside speculators, or be used to extort money from the established gas companies. Mr. Schroeder has yet to explain his part in this business. After the charter was passed he permitted the politicians to whom it was given, to use it as they pleased for nearly two years, without exacting from them a single guarantee of good faith. The effect of the charter was seen not in bringing any reduction in the price of gas to the people, but in diminishing the price of gas stock, the Mutual charter became an instrument for "bearing" purposes, and thereby hundreds of widows and thousands of children, who had their estate invested in such stock, were brought to embarrassment, if not poverty. The best possible proof, however, of the intent of the Mutual gas men is in the fact that specified works have not been constructed, that the capital stock was never paid in, that the Attorney General of the State took action to remove the corporation from the face of local affairs. The enterprise was simply a rascally speculation.

The efforts that have been made this year at Albany to revive the now defunct powers of the Mutual gas charter have been brought to the attention of our readers, as is the fact to day that the efforts were covered with defeat in the Senate last night. In various ways and under various pretexts, and by representatives from other parts of the State, bills have been introduced, pretending to be of a general character, but designed for no other purpose than to resurrect the corpse of this Brooklyn monstrocity. For weeks past the lobbies of both Houses have been occupied by representatives of this enterprise. Jourdan, Dagget, and their associates have been most busy. They have spent weeks at Albany. Every Senator or Assemblyman who would submit to the touch of their fingers has been buttonholed by them, and the end of it all is failure. Senator Jacobs, who is always vigilant and always efficient, succeeded, with the timely and discreet assistance of Senator Pierce, in burying the scheme so deeply, that no resurrection will ever be attempted. It is not necessary to describe here what is so graphically described in our Albany letter. Suffice it to say that Senators Jacobs and Pierce gave very abundant proof last night by their treatment of the job in question, that they are the right men in the right place.—*Brooklyn Eagle, May* 15.

MORE GAS, NAPHTHA POLITICIANS, JOBS AND A SUGGESTION.

There is something proteau and kaleidescopic about the jobbing politicians of this city. It was but yesterday that they threatened to carry off four hundred feet of Coney Island beach. Not long ago they took on the shape of railroad enterprise, and notified an astonished public that they had gaanted themselves the right to run a barricade of iron between the hotels and the beach; between these undertakings they found time to draw up a scheme for sadding upon the shoulders of the general taxpayers the difference between what they hoped for, and what they realized by certain real estate speculation; at a somewhat remoter period they dipped into the mysteries of architecture, and brought before the eyes of a wonder stricken people the new Municipal Building; at a still earlier day they gave themselves a charter to make ducks and drakes of the gas business of Brooklyn; in October last they concluded to purchase at their own price the government of the city, and as a result we had the pleasure of seeing them bag the four chief municipal departments, while on the top of all we have the latest transformation scene in tha shape of a grand naphtha illuminating combination. If we were making a complete record of the achievements of these clever gentlemen, we should have to describe schemes for elevated railroads at other people's expense, propositions to overhaul the shipping and dock interests of the city, movements which, if carried to their logical conclusion, would force the city to give each of the thrifty promoters two city lots, a brown stone house, a well furnished stable, and the most improved style of carriage, with at least one excellent span of horses. Into the details of all these dazzling enterprises we cannot go at present. Some day we shall probably have them set out in book form, entitled "The Romance of Brooklyn's Political History." In the meantime it is proper to say that the EAGLE, wearied by the unremitting efforts required of it to prevent these gentlemen from dividing the city into well defined portions for their respective benefits, suggested some time ago, as a compromise, that they be bought off, either by the surrender to them of the whole of Coney Island beach, the whole stock and equipment of the street railroads, the boats, docks, leases and surplus of the Fulton Ferry Company, or the meters, mains and other appurtenances of all the gas companies in the city. The reader whose recollections of history cover the Middle Ages, will remember that the principle recommended by the EAGLE was at one time very common in many parts of Europe. Indeed, it prevails to-day in Sicily, and according to travelers, is recognized as the very basis of prosperity in some of the provinces of China. The German farmers of the Fifteenth Century esteemed it no hardship to part with a third of all their possessions to the politicians, then called robber barons, in exchange for permission to hold the remaining two-thirds without molestation. Coney Island is, we suppose, worth $20,000,000. It would, we think, sell for that. The politicians whom the EAGLE would like to see bought off are twenty in number. Our offer, therefore, is to give them a million apiece. This may seem a large price to pay, but let those who think so reflect upon the enormous interests that these gentlemen jeopardize while they remain at large. The water front of the city is worth easily $100,000,000, and that is but one of many interests open to assault. At the next Legislature we shall urge the passage of a bill submitting this question to the voters of the city at the following election.

In the meantime we recur to the Naphtha Gas Co., the head of which is ex-Senator Coe, who so lately jeopardized Coney Island, and the tail of which is partially hidden from view. Mr. Coe's naphtha was forced as suddenly upon popular attention as the Mutual Gas charter or the Coney Island enterprise. In a way that could not have been surmised, a clear majority of the Aldermen became convinced, without any public discussion, that naphtha gas was destined to be the light of the century, and that Mr. Coe's company ought to be permitted to furnish it, without regard to any other actual or possible naphtha company. Our distinguished fellow-citizen, Honest John French made the longest speech of his life in support of the Coe company. Mr. Ray grew eloquent in urging that the whole city should be furnished with the naphtha illuminator, and Mr. Fisher, in a variety of discreet terms, placed himself on the side of "economy, reform and progress." Final action, however, was deferred for a week, and yesterday the subject was recurred to, when, on motion of our distinguished fellow citizen, Brother French, the following resolution was adopted:

Resolved, That the contract for furnishing gas or other illuminating material for the street lamps, and for lighting, extinguishing, cleaning and repairing said street lamps in the district heretofore lighted by the Williamsburgh Gas-Light Company be and the same hereby is awarded to the New York and New Jersey Globe Gas-Light Company, of which John W. Coe is agent, at the price set forth in their proposal, publicly opened and announced on May 10, and the Board of City Works are hereby directed to cause a contract to be prepared and executed therefor in accordance with the specifications on file in the Board of City Works.

Leaving out of view all political or jobbing considerations for the present, there is this to be said of the gas business of the city, as suggested by the adoption of the naphtha resolution. The gas companies have themselves to blame for the fact that politicians of any class and of all classes feel at liberty to attack them. The gas business of Brooklyn, as a whole, may properly be denominated a colossal job, though the profits of it have not by any means gone into the pockets of the majority of people who now own the stock. The city has been parceled out among the existing companies for reasons which are not recognized as valid in any legitimate business; the consumers of gas have been confronted with millions of watered stock and asked to pay prices which should return interest upon that stock, which, in fact, had no connection with any honest investment. This stock has been worked off upon the people in various walks of life, and much of it can be obtained for less than fifty cents on the dollar, because when times became hard, people refused to pay fancy prices for gas as for anything else, and because criticism long ago disclosed the fact that the stock issued represented pretentious privileges, and not anything pertaining legitimately to the manufacture or distribution of gas. Of all the companies in Brooklyn against whom this charge lies, none can possibly be worse than the one in whose district the naphtha men are to begin operations. The Williamsburgh company issued a million dollars worth of watered stock at one move, and upon that the consumers are expected to pay, and in fact have been forced to pay interest. It is not the EAGLE's fault if any considerable number of gas men have persisted in the belief that such tactics could be continued indefinitely. The wrong was pointed out long ago and has been dwelt upon so often as to be something of a bore. For the naphtha men, as for Jourdon, we have little respect. Their ways are not right ways, but they would be powerless were it not that the system against which they have directed their enterprise is rotten. It is pitiable to think of any person seriously proposing to have Brooklyn take the step backward, which is involved in abandoning gas for naphtha, but all steps will be taken until the gas business is placed on a legitimate basis, and only legitimate prices charged. The gas stock of the city bears a nominal value of about $10,000,000. The works, mains, and other proper appurtenances are not worth more than $2,500,000. It needs no argument to prove that the attempt to get interest on $10,000,000 out of an investment amounting only to a quarter of that sum is extortion. Putting aside the naphtha men and the Mutual men as persons who are busy because they snuff carrion, it remains to be said that the gas business of Brooklyn is in urgent need of consolidation and reorganization upon a business basis.

THE ALDERMEN.

COMPETITION INVITED AGAINST THE OLD GAS COMPANIES—NAPHTHA GAS TO BE USED IN THE EASTERN DISTRICT.

A regular meeting of the Board of Aldermen was held at two o'clock yesterday afternoon, Francis B. Fisher, Esq., President, in the chair.

The minutes of the last meeting were read and approved.

The special order was the awarding of the gas contract on the following recommendations:

DEPARTMENT OF CITY WORKS,
BROOKLYN, May 13, 1878.

To the Honorable the Common Council:

Gentlemen: On May 10th, 1878, proposals were publicly opened and announced for furnishing gas, etc., for street lamps and the public buildings.

The proposals were severally as follows, to wit:

Williamsburgh Gas-Light Company, by C. E. Blodget, Secretary.

In the district occupied by the pipes of the Williamsburgh gas-light company, for street lamps from

May 1, 1878, to December 31, 1878, inclusive, $19 each, per lamp; also to furnish gas for the public buildings at $2.15 per 1000 cubic feet, and the United States revenue tax, if imposed. Bills are to be paid monthly.

Citizens gas-light company, by C. T. Catlin, Secretary.

Price for each lamp complete to be $19, for the unexpired portion of the year 1878, from May 1 to December 31, both inclusive. Bills payable monthly.

Price for the public buildings to be $2.15 per 1000 cubic feet consumed. Bills payable monthly.

The Brooklyn gas-light compsny, per E. Storer, cashier. To furnish gas for the street lamps, light and extinguish the same and keep the same clean and in repair, for the sum of $18.23 per lamp of three feet burners, from May 1 to December 31; also to furnish gas for public buildings at $2 per 1000 cubic feet. Bills payable monthly.

Metropolitan gas-light company, by C. H. Stoddart, Treasurer; street lamps at $19 each, provided three feet burners are used, and the time of burning is fixed at 2,326 55-60 hours. The price to include cost of gas, lighting and extinguishing, and cleaning and repairing; United States internal revenue tax on gas to be added, if any is imposed.

Public Buildings—To furnish gas for the public buildings at $2.15 per 1000 cubic feet, United States internal revenue tax to be added, if any is imposed, the gas to be equal to an average candle power of 15 candles at the works of the company. Bills to be paid monthly.

The Peoples' gas-light company, by Edwin Ludlam, President: For furnishing gas to the public buildings at $2.15 per 1000 cubic feet. For each and every lantern lighted the sum of $19 for the above eight months. In addition to the above figures, the government tax, should any be levied. The bills to be paid monthly.

The Nassau gas-light company, by S. T. White, Secretary: For gas supplied to public buildings for the unexpired portion of the year, commencing May 1, 1878 to and inclusive of December 31, 1878, at $2.15 per 1000 cubic feet. For gas supplied to street lamps, lighting, extinguishing, cleaning and repairing the same for the unexpired portion of the year, commencing May 1, 1878, to and inclusive of December 31, 1878, at $19 per lamp.

The New York and New Jersey Globe Gas-Light Company, (limited) John W. Coe, Agent. For furnishing gas generated from naphtha, of candle power as required in specifications, lighting, extinguishing, cleaning, repairing, and maintaining all or any portion of the street lamps in the district now lighted by the Williamsburgh gas-light company, at the rate of $23 per lamp, per annum, for the balance of the year 1878, said price per lamp to cover each and every item of service, which the specifications above referred to require. Respectfully submitted,

F. S. Massey, President.

In connection therewith Alderman French offered the following:

Resolved, That the contract for furnishing gas or other illuminating material for the street lamps, and for lighting and extinguishing, cleaning and repairing said street lamps, in the district heretofore lighted by the Williamsburgh gas-light company, be and the same hereby is awarded to the New York and New Jersey Globe Gas-Light Company (John W. Coe, agent) at the price set forth in his proposal publicly opened and announced on May 15, 1878, and the Board of City Works are hereby directed to cause a contract to be prepared and executed therefor, in accordance with the specifications on file in the department of city works.

Alderman Ray moved to amend by adding thereto the following:

"And that the Board of City Works be and are hereby directed to enter into contract with the New York and New Jersey Globe Gas-Light Company to light, extinguish, clean and repair five hundred lamps in each of the districts controlled respectively by the Brooklyn, Citizens', Metropolitan, Nassau, and Peoples gas-light companies, at the terms of their bid now before the Board for lighting the lamps in the district now lighted by the Williamsburgh Gas-Light Company."

The communication from John W. Coe was read as published in last night's Eagle.

Alderman McIntyre was called to the chair.

Alderman French moved to amend the amendment offered by the chairman from the Thirteenth by adding "The same to take effect within thirty days after the execution of the contract."

Alderman Fisher then offered the following as a substitute for the whole matter:

Resolved, That the Board of City Works be and hereby is directed to enter into contract with the New York and New Jersey Globe Gas-Light Company to light, extinguish, clean and repair so many lamps in the Williamsburgh Gas-Light Co.'s district as the said New York and New Jersey Globe Gas-Light Co. shall have in running order within thirty days after signing their contract for lighting the streets.

Alderman Baird presented a petition which he said had been signed by 14,000 persons in favor of the use of naphtha gas.

Alderman Ray did not think the substitute was in order; he claimed that it was nothing more than the original motion in another form, and on that asked the ruling of the chair.

The chairman said he had compared the substitute with the original motion, and the substitute was in order.

Alderman O'Reilly asked whether he could have the privilege of starting a factory to light as many lamps as he could get ready by the end of thirty days?

Alderman Fisher said the Board by a deliberate and unanimous vote had expressed a desire for competition, and had ordered a re-advertising. What motive was there for re-advertising except to get another illuminating material? They had secured competition, and to that fact was owing that the gas companies had already come down in their prices. The new illuminating material had already benefitted the people, as was shown on last Friday night when the gas company put on larger burners for the purpose of outshining the new illuminator.

Alderman O'Reilly asked, supposing the Naphtha company should have 1000 lamps at the end of 30 days, what would become of the balance of the lamps; would the old gas companies light them?

Alderman Fisher said most assuredly, the Board had got to give the new company a chance, for they had brought forward a light which had proved acceptable in New York, and had caused gas to go down there to the sum of $14 per light. That showed what competition would do, and the same result would follow in this city if the new company should be allowed to light the district for which it had put in bids.

Alderman Petry asked whether the Williamsburgh people alone had asked for the new illumination, and if through them a large saving was effected would the people of that section receive the benefit of it, or was the money saved to be credited to the people of the city at large,

Alderman Fisher said that in another year he should be in favor of having the new illuminator used all over the city.

Alderman Ray thought the members would bear him out in the assertion that he had not said anything calculated to put a damper on the propositions made by the gentleman who had put in the bids. He simply wished to test the sincerity of those who had advocated that the Eastern district alone should have the benefit of the new illuminating material. The proposition he had made was a fair one, and he thought the people of the whole city should have some of the benefits which were promised by the use of the new illuminating material. Great stress had been laid on the statement that the Williamsburgh company was the most grasping and avaricious of all the companies, but he thought it was not more avaricious than the Brooklyn or other companies. On one occasion the Williamsburgh company had paid a dividend of 100 per cent., but the reports showed that for a period of sixteen years the Brooklyn city company had paid an annual dividend of 50 per cent.

Alderman O'Reilly expressed a desire to have the member from the Twenty-third ward explain the meaning of his substitute. He was not prepared to vote for it without some explanation.

Alderman Ormsbee had made it his business to visit Harlem for the purpose of seeing the new illuminator, and from what he had seen he thought it would be unjust to saddle the whole thing on the people of the Eastern district. The thing had proved successful in New York, and he did not see why it should not prove successful in Brooklyn.

Alderman Kenna, like his colleage from the Fifteenth ward, had visited the Harlem district, and where he had a chance to compare the naphtha with the coal gas, he found that one of the old gas lights was worth two of the other. Many of the people told him they got along with naphtha gas, but would much prefer the coal gas. They admitted that it was a saving, but occasionally it went out, without any apparent cause. The people also admitted that they had heard of explosions taking place, but he could not get any definite information on that point, but occasionally the naphtha leaked and then it ran down and burned on the sidewalk. From what he could learn it seem to him that the people of the Eastern district did not want the new light there at the present time.

Alderman Fisher said it gave him pleasure to hear the statement made by the gentleman from the Fourteenth ward, who had laid the matter before the Board very clearly and with a great deal of force. In the city of New York it should be remembered that larger burners were used than in Brooklyn, so that any comparison between the two cities would not be fair.

Alderman O'Reilly asked whether it was intended that the city should exact security from the Naphtha gas company?

Alderman Fisher replied most assuredly it was.

Alderman O'Reilly asked how it was to be done if the substitute should be adopted? The company could get one lamp ready if it chose, and then say to the old company, "We don't want to interfere with you at all," and the city would be still in the same old hole. He did not think the Board should be bamboozled by the chaff thrown out so neatly by the gentleman from the Twenty-third ward.

Alderman Ray said naphtha was just as cheap in South Brooklyn as in Long Island city, where the works are located, and it was only two cents dearer in Germany. He could not for the life of him see why the company objected to lighting lamps in other portions of the city, he wished to give them 2,500 lamps, and would guarantee that they should be got ready within twenty days. In all probability he should vote for it in his own district, but he wished to extend the benefit to other portions of the city.

Alderman Dwyer wanted to know why it was that the substitute and amendment, and a whole lot of those things could not be referred to the Lamp and Gas Committee for a week, in order that the members of the Board might find out something about the matter. There was something very unusual in what was going on, and if it was in order he should move that the whole subject be referred to the Committee on Lamps and Gas, and that the Naphtha company be requested to give an exhibition of their light.

Alderman O'Reilly offered the following as a substitute for Alderman Fisher's resolution:

Resolved, That the Board of City Works be and are hereby directed to advertise for proposals for lighting the streets of this city with gas, or any other illuminating material, each bid to cover as much territory and as many lamps in each district as the Common Council may determine, the price to be fixed at so much per lamp per month.

Alderman Fisher asked the ruling of the chairman on the question of the last substitute being in order.

The chairman ruled that it was not in order.

Alderman Murtha thought if the proposition of the Naphtha gas company was entertained at all, it should be done on the basis of the proposals submitted by the company. If the Board got away from that plan it would be treading on dangerous ground, and to dump the contracts in the manner proposed by the gentleman from the Twenty-third ward, would not accomplish anything.

Alderman Fisher was satisfied, from what had been said by the members from the Twelfth and Ninth wards, that his proposition was wrong, and therefore, if no objection was made, he would withdraw it.

Alderman Burnet said the amendment of the gentleman from the Thirteenth ward was at variance with the provisions of the charter, and if adopted it would have the effect of releasing the gas companies from the conditions under which they entered into contract with the city. All that the Board could do was to take up the proposals as they had come in, and direct that contracts be entered into with the lowest bidders.

Alderman Ray said he was perfectly willing to withdraw his amendment, if the other substitutes were withdrawn, and then the Board of City Works directed to readvertise for proposals, and the new company invited to bid for the whole of the districts.

Alderman Dwyer withdrew his motion to refer.

Alderman Fisher was in favor of readvertising, providing the new company was given a sufficient length of time to get ready. The only objection to that plan, however, was that in the meantime the old companies would be reaping the benefit of the delay.

Alderman Ray did not think that would signify. Even if the Naphtha gas company should not light a single lamp, the prices of the old companies would come down 50 per cent., as soon as they knew that there was to be competition.

Alderman French—Our papers, some of them, don't present the advertisements authorized by the Board in the four editions. The fourth edition of the most prominent paper does not contain these advertisements, they are put in the third. In the fourth edition, the fact is, the advertisements are not mentioned, and I think that is the great difficulty in the way—the advertisements are not seen.

Alderman O'Reily, in answer to a question from Alderman Murtha, said the intention of his resolution was that the contracts should be awarded according to the present number of lamps in each district.

The question was then taken on Alderman O'Reilly's resolution.

It was lost by the following vote:

Affirmative—Aldermans Dwyer, Kane, Phillips, McIntyre, O'Reilly, Kenna, Petry, Williams—8.

Negative—Aldermans Burnet, Aitken, Black, Murtha, Gunder, Ray, Ormsbee, Cottrell, Baird, French, Duane, Fritz, Fisher, Dreyer, Easton—15.

Alderman Murtha moved to add to the original resolution offered by Alderman French, "provided, however, that the city shall have the right to cancel the contract at any time within 60 days, upon giving notice that the light furnished is not up to the standard."

The amendment was accepted.

Alderman Burnet then moved that the Board award the contracts to the several gas companies, as presented by the President of the Board of City Works, as well as to the New York and New Jersey Globe Gas-Light Company.

The motion was lost, Alderman Burnet and O'Reilly being the only members who voted for it.

Alderman Burnet then raised the point that by the vote just taken, all the contracts had been rejected.

Alderman Murtha stated that he was opposed to gag law in any shape. If the point raised by the gentleman from the first was a bit of sharp practice by which the people of the city were to be cheated out of thirty or forty thousand dollars, then the sooner the last vote was reconsidered the better.

Alderman Burnet disclaimed any intention of resorting to gag law or cheating, and asked for the ruling of the chairman on the point he had raised.

The chairman—The ruling of the chair is, that the amendment having been lost, the question now recurs upon the original motion before the Board.

Alderman Burnet said it was a question of law, not of order. He had not, however, intended any trick and would therefore move a reconsideration of the vote just taken.

Alderman Murtha then disclaimed having intended to charge the gentleman from the first with resorting to a trick.

The motion to reconsider was carried.

The other amendments were subsequently offered, one of which was afterward withdrawn and the other voted down.

Alderman Petry moved to except the Sixteenth Ward.

The motion was ruled out of order.

The question then recurred on the adoption of the resolution offered by Alderman French, that the contract be awarded to the New York and New Jersey Globe Gas-Light Company.

It was adopted by the following note:

Affirmative—Aldermans Burnet, Dwyer, Aitken, Black, Kane, Phillips, McIntyre, Murtha, Gunder, Ray, Ormsbee, Cottrell, Williams, Baird, French, Duane, Fitz, Fisher, Dreyer, Easton—20.

Negative—Aldermans O'Reilly, Kenna, Petry—3.

Unanimous consent was objected to by Alderman O'Reilly.

The awarding of the other contracts was postponed until they should be reached in the regular order of business.

Alderman Fisher resumed the chair.

The Keely Motor Bubble.

Mr. J. B. Knight, the accomplished Secretary of the Franklin Institute of Philadelphia, and an expert in Mechanical engineering, sticks a large-sized and sharp pointed pin into the Keely motor bubble, in the form of a report which we print on another page. Mr. Knight does not claim to have learned all the tricks by which Mr. Keely produces the results that have surprised the credulous, but he shows very clearly that Mr. Keely's machine did nothing while he was inspecting it which could not be done with very simple apparatus using a small volume of compressed air. Samples of the so-called "vapor" which Mr. Keely claimed to have produced in his "multiplicator," and said by him to possess an elastic energy of 12,000 pounds per square inch, were analyzed by Dr. Cresson and found to be atmospheric air at a power of 225 pounds. Mr. Knight shows how he was thwarted by Mr. Keely in his attempt to get at the real facts of the case, and how in nearly every instance the promises made him before the examination began were broken or repudiated. The story will not surprise many of our readers who know enough of the laws of physics not to be misled by claims to accomplish mechanical miracles, and who have learned from experience or study that more power cannot be got out of one end of a machine than goes into it—in the shape of fuel to work done—at the other; but it has a curious moral. The readiness with which men, ordinarily cautious and careful, will invest capital in enterprises of which they know absolutely nothing, is marvelous, and only serves to illustrate an old proverb which speaks in uncomplimentary terms of capitalists who part with their legal tenders without good security.—*Iron Age, April 4th.*

Mr. Knight's report is given in full in the *Iron Age*, and the following are the conclusions arrived at:

CONCLUSIONS.

Thus it will be seen that there was not the least evidence of the production or presence of a new vapor, and while not claiming to have shown the methods employed by Mr. Keely, it has been clearly shown that all his experiments can be performed with comparatively simple apparatus. In brief, therefore, the following conclusions are fully warranted:

1. That the machine called the "multiplicator" and its attachments, including the so-called "reacting device," are not capable of producing the effects claimed, and that their enormous strength is entirely unnecessary in sustaining the pressure to which they are subjected, but are rather calculated to astonish and mislead those who witness his experiments.

2. That the extreme high pressure claimed was not produced, probably in no case exceeding 500 pounds per square inch; and that the readings of the gauges and weighted lever apparatus were incorrect.

3. That the so called vacuum was not produced by the condensation or absorption of the alleged vapor, but by mechanical means, such as a previously exhausted chamber, or its equivalents.

4. That the substance used and claimed by Mr. Keely to be a new vapor of his own discovery is simply atmospheric air, which had been previously compressed and stored up in the various hollow spheres and other chambers of the apparatus in the intervals between the experiments.

THE CHEMIST'S REPORT.

417 WALNUT STREET, PHILADELPHIA, Dec. 6, 1877.

I have completed the examination of the gases brought to me. That which was labeled "Gas collected from the exhaust pipe of engine exhibited by Mr. Keely as being run by vapor from the Keely motor machine," consisted of—

Oxygen	20.85 per cent.
Nitrogen	79.15 "

and did not contain any appreciable amount of any other gas.

That contained in the wrought-iron tube labeled "Vapor produced in the Keely motor machine, received from Mr. Keely for examination, and said to be under a pressure of 1200 lbs. to the square inch," consisted of—

Oxygen	20.88 per cent
Nitrogen	79.12 "

and was free from all other gases.

I ascertained that the pressure to which the gas was subjected in the iron tube was 15 atmospheres (225 lbs. to the square inch), and it was not under a pressure of 1,200 lbs. per square inch, as noted upon the label. The results in analysis were obtained by examination, in which the gas was treated over mercury without contact with water. This latter sample was found to be very free from moisture.

To determine whether the latter gas was condensable by water, an accurately measured amount of it was exposed to a varying water surface in an endiometer tube. There was no loss of value, and, consequently, no absorption by the water. Ordinary atmospheric air contains (Bunsen's Gasometry, London, 1857, p. 71):

Oxygen	20.97	20.84
Nitrogen	79.03	79.16

It is evident, therefore, that the samples examined are simply atmospheric air.

Respectfully,

(Signed) CHAS. M. CRESSON, M. D.

Electric Lighting.—Dr. C. W. Siemens lectured on this subject before the Society of Telegraphic Engineers. He is, perhaps, the most eminent practical electrician of the day, and his opinions have great weight. His machine and light are the most perfect at present in use, and we may look to him to take the lead in the development of the electric light. On the whole, Dr. Siemens agrees with the speaker quoted above, as to the difficulty of subdividing the current, and cheaply distributing the electricity to produce light. He says: "The complete realization of all the advantages of the electric light remains, however, a problem to be solved, and it would be extravagant to expect, from applications on a small scale such as have hereto been made, anything like the amount of relative advantage indicated by theory." In the meantime, the Money Market shows that a sagacious public maintain a firm belief in the stability of gas shares, which have now almost returned to what we may call their normal prices; and, everything going well, gas property will probably increase in value during the year.—*Journal Gas Lighting.*

Correspondence

[Correspondents, in all cases, should sign their communications with their names and address in full—not for publication, unless desired, but as a guarantee of good faith.—Ed

[Special Correspondence of the American Gas-Light Journal.]

Gas Notes from Ohio.

Columbus, Ohio, May 22d, 1878.

The "gas question" has been very considerably agitated in the city of Evansville, Ind., during the past few weeks. The proposition on the part of certain parties to start a new or opposition gas company, has caused the greatest amount of discussion both through the press of that city and in a private way.

Both sides, as is always the case on any subject, present plausible arguments in favor of their own views. The newspapers of the town have taken hold of the matter, and column after column of leaded editorials on the "cost of manufacturing gas," have been gratuitously given to the citizens of that thriving Hoosier city. That any body has been enlightened by the discussion I will not undertake to affirm. That the writers of "cards," communications and editorials have been made happy by seeing their (in their own opinion) wise reasonings in cold type, no one will hardly deny.

From the arguments and statements made by the existing company, it appears to be an established fact, though not an undisputed one, that the company, which is called the Evansville Gas-Light Company, is a prudently managed institution, owned and operated by citizens of Evansville, and largely in the interests of that city, to the growth of which it has contributed largely. The old or existing company argues that from the very nature of the business it will be impossible for a new company to maintain competition with any advantage to consumers, for the simple reason that the expense of delivering gas, the erection of new works, laying of mains, &c., &c., will be so great that the old company, having already established and perfected their works, and having their mains and pipes laid and connecting everywhere, can, if it becomes a matter of competition, swallow up the new company by reductions, and then again return to the profitable price. They also assert that no city can afford to needlessly destroy, embarrass or interfere with the reasonable success of her local institutions or industries, except in cases of extreme necessity, which they affirm does not exist as regards the present gas company. The existing company has offered to make a contract with the city of Evansville, to furnish gas to the city at one dollar and a half per thousand, and to private consumers at two dollars and twenty-five cents. I cannot imagine why so great a difference is made in the price offered to the city and to private consumers. It seems to me that if the company can afford to sell the article at $1.50 per thousand to the city, they can sell to private consumers at the same rate. But even at the price mentioned, $2.25, it would be reasonably cheap compared with the price of gas in any other city of its size in the United States.

The Evansville *Courier* advocates the erection of works by the city, and the running of them by the municipal authorities. Those who know anything at all about local politics know what a mess this would make; what fine apportunities it would afford those who make their living out of politics to make "big stealings," and how the people would be plundered.

A new and patent invention for shutting off and extinguishing the gas in public lamps is now being introduced into some of our Western cities. In the East it perhaps is no longer a new thing. The little machine operates like a clock. It is set to run so many hours, and when the specified time has elapsed, the machine turns off the gas, of course extinguishing it, and no more can be consumed until the instrument admits of it. Through the agency of this invention all the gas lamps in a city can be extingnished at once and with as much accuracy as if the gas had been shut off from the street mains. If this "regulator" will accomplish what is claimed for it, it will do away with the army of men employed in every large city to extinguish the lamps, and by shutting off the gas on all the lamps at the same hour and minute, save largely for the gas company in the gas consumed by the last posts to be extinguished in each lighters division, during the time intervening between the extinguishing of the first and last lamp.

I wrote you in a former letter of the charges of embezzlement that had been brought against Mr. John Cain of Louisville, Ky., both by that city and by the Louisville Gas Company. Mr. Cain was for a long time the Secretary and Treasurer of the Louisville Gas Company, and after he severed his connection with the company, a shortage of over fifty thousand dollars was found in his accounts. He explained it by the statement that the money had been used, under directions from the officers and directors of the company, to manipulate the state legislature in having legislated the law which now gives the gas company a contract for ninety-nine years. The grand jury of the circuit court of Louisville have had the charges before them for some time, and after the examination of witnesses, books, accounts, &c., on Monday, May 20th, dismissed them failing to find an indictment against the gentleman, and Mr. Cain is vindicated.

In Findlay, Ohio, differences have for some time existed between the gas company and the common council, both in regard to the price of gas to private consumers and to gas furnished the public lamps. A heavenly calm, however, has dawned upon the opposing parties, and a dove like peace now reigns in the mutual affiairs of the gas company and the municipality of Findlay, the common council having conceded all the claims of the gas company.

The gas company of Covington, Ky., is still having trouble with its consumers, and innumerable suits are being brought against the corporation to recover alleged excessive payments. The late decision of the Chancellor's court, in the case of the city of Covington *vs.* the Covington Gas Company, which was adverse to the latter, has caused all the trouble. The last party to bring suit on the above mentioned grounds is the Roman Catholic Cathedral of Covington, to recover the sum of $500 alleged to be over paid.

The Cincinnati Gas-Light and Coke Company held its annual election for a Board of Directors on Monday, the sixth of this month. A large number of stockholders were present, and the vote cast was a full one, being mostly by proxies. The directory of this company consists of seven, one of whom, General A. Hickenlooper, is the president. Two of the old directors, Mr. W. W. Scarrborrough and Mr. John F. Torrence, having declined a reelection, Mr. Robert Allison and Mr. Henry Muelhauser were unanimously elected to fill the vacancies. Mr. Scarrborrough was for several years the president of the company, and under his management the affairs of the organization were entirely successful. About one year ago he retired from the presidency, and General Hickenlooper, the vice-president, was elected to his place. Mr. Scarrborrough remained in the "Board" during the past year, but now retires permanently from all active business life. He is a gentleman of wealth, and being yet in the strength and vigor of life, undoubedly has many years before him in which to indulge his tastes (for which he is noted) for all things that are refined and cultivated in art and the æsthetics. He was always just and kind to each and every employee of the company, and they all cherish him with pleasant feelings and sincerely regret his severing himself from them.

The newly elected Board of Directors at their first meeting reelected General Hickenlooper President, Mr. Robert Brown, Jr., Secretary, and Mr. M. H. Coates, Treasurer. All of these gentlemen have been efficient and faithful officers of the company for many years past. General Hickenlooper is a young man, a civil and gas engineer by profession, possessed of a strong positive character, and has fine executive qualities. He is quick in his decisions, and always clear and concise in his opinions. Industry and application are the strong traits in his character.

He has the absolute confidence of the directors and stockholders, and under his guidance the Cincinnati Gas Company is in a highly prosperous condition.

Experiments with the electrical light on an extensive scale have recently been made in Cleveland, Cincinnati, Chicago and other Western cities.

So far as my information goes nothing has been developed by these experiments except the wonderful brilliancy and power of the light, and that fact has always been known. The attempts to *control* the light so that it can be used as gas now is, anywhere or everywhere, in the theatre, the saloon, the sitting-room or bed room of a private family, have thus far, in the West, proved futile. With some of the newspapers of the West the "electrical light" has become a never ending theme. Especially is this so with the Cincinnati *Commercial*, a paper proverbial for its "hobbys." Almost daily it dishes up in the editorial columns masses of "matter" on this subject, predicting the final disuse of coal gas and the everlasting triumph of electricity.

Parties from New York City have been in Cincinnati recently, exhibiting the electrical light and making efforts to induce some of the large consumers of gas to pay them for an experimental trial of the light in their establishments.

The proprietors of the Grand Hotel in that city had the matter under serious consideration, but when the agents of the light announced their terms, $5,000 in cash, they took a very different view of the case, and could not discover with a microscope where the much talked of economy came in. To light the Grand Hotel with coal gas when its owners are doing an average business, costs about ten dollars a day. The parties having the electrical light guarantee to reduce the cost of lighting, if electricity is used, to one dollar and a half per day. The power of the light no one can dispute. Its utility for *all* and *ordinary* illuminating purposes has not yet been demonstrated in this part of the world.

The new Music Hall in Cincinnati, which last week was so gloriously dedicated, is a most beautifully lighted building. It contains over eleven hundred gas jets, and the entire building is lit up at once by electricity.

A short time ago the coal oil men of this city, Cleveland, Cincinnati and other places, sent their agents with oils and lamps everywhere and to everybody, making a thorough crusade against the gas companies. The result was a general falling off of consumers, and some of the gas people became "panicky" and terribly alarmed. The cooler heads said: "Don't be frightened, this is only temporary, and they will all return to gas." Time has proved the opinions of the "cooler heads" to be correct. The coal oil experiment has "played out," and those who indulged in it are selling their lamps for nothing or throwing them in the street, and vowing never again to return to the bad-smelling, greasy, dismal stuff. There seems to be a disposition on the part of gas companies "all along the line" in the West, to make a moderate and fair reduction in the price of gas, a reduction that will be consistent with the general depression of business and the hard times which are being felt all over the country.

But no matter how reasonable the gas companies may be, or what efforts they may make to please the people, there will always be some, and they are many too, who will denounce the corporation and every body connected with them as thieves and scoundrels, and assert that Judas Iscariot was a model of all that is good and honest compared with the man who has any connection with a gas company. After all, is not the feeling of bitterness that is so universally expressed against gas companies similar to that of the poverty stricken communists who hates his prosperous neighbor, not because there is any bad in him or that he ever injured a hair of his head, but for the simple reason that—he is prosperous!

Ubiquity.

Bay City Wood Pipe.

TOPEKA, KANSAS, May 23, 1878.

Mr. Editor: The publication of my short communication in the last number of your Journal has called forth the following letter from the Minneapolis Gas-Light Company, which I take the liberty to send to you for publication, together with this note, if you think them of sufficient interest to justify it. The experiments heretofore made with this kind of pipe, have been so prejudicial to the interest of the companies trying them, that it would seem to make any reasonable effort proper to save other companies from like loss.

Yours very truly,
J. T. CLARK, Secretary.

MINNEAPOLIS, MINN., May 20, 1878.

J. T. CLARK, Esq.

Dear Sir: I notice your card in the GAS-LIGHT JOURNAL of 16th inst., concerning Bay City Wood Pipe.

You can mark our company down among the rest of the easily-gulled. We put in about 20,000 feet of the stuff, and have taken it all up and laid iron. We averaged over two million feet annually leakage on this pipe for three years, notwithstanding we were working incessantly on to keep it tight,

Red Wing Gas-Light Company, Red Wing, Minn. First plant was entirely of this pipe, and they last season replaced the whole of it with iron. Faribault, this State, was in same condition. It is miserable stuff and am glad you gave it publicity. Truly,

H. W. BROWN.

[From the Pittsburgh Daily Dispatch. May 7.]

Consolidated Gas Company.

ANNUAL MEETING OF THE STOCKHOLDERS—THE REPORTS OF THE OFFICERS—THE YEAR'S BUSINESS—ELECTION OF DIRECTORS AND OTHER BUSINESS TRANSACTED.

The annual meeting of the Consolidated Gas Co. was held yesterday afternoon at the Company's office, No. 327 Penn avenue. Mr. H. M. Bennett was called upon to preside, and D'Arcy E. Boulton, secretary of the company, was chosen to fill the same office for the meeting. An election for directors was then entered into. Col. Boulton was appointed to act as judge of the election, and Messrs. Neeb and Kehew tellers. While the balloting was being proceeded with the annual reports were read. From the sixth annual report of the President and Directors it is learned that, to give the required amount of pressure, an additional supply pipe was laid from the gasometer toward the central part of the city, a connection being made at Sixteenth street with the main on Penn avenue. The results during the past winter have proved eminently satisfactory, an inch more pressure being obtained—with a largely increased consumption—than during the previous winter. The report then cites the main features of the reports of other officers.

The report of the secretary shows that during the past year there has been laid in all 12,884 feet, or two and a half miles of pipe, at a cost of $12,369.50, less $1,400 for pipe on hand, making a net cost of mains laid of $10,969.54. In a statement accompanying the report the increase of consumption for the four months beginning July 1, 1877, shows a falling off of 771,600 feet over the corresponding period of the previous year. This is, in a very great measure, due to the riots of July, when the company lost the entire consumption of the Pennsylvania Railroad, besides many other very large consumers from the same cause, all of whom have long since been recovered.

WHAT THE GAS WAS MADE OF.

The report of the Chief Engineer shows that there was used in the manufacture of gas 13,296 barrels of benzine, at a cost of $13,198.81, against 11,163 barrels, at a cost of $13,775.73 for the preceding year, showing a decrease in cost of $556.92, and an increase of 2,133 barrels over 1876. The number of bushels of slack used in the manufacture of coke was 256,604, costing $11,805.56, and the number of bushels of coke manufactured and sold was 279,392, amounting to $10,317.05, showing the cost of obtaining the gas from the coke ovens during the entire year to have been only $1,488.51, being a large decrease from any previous year. The amount of lime used in purifying was 1,997 bushels, costing $339.49.

The explosion which occurred at the works of the Pittsburgh Gas Company, in November of last year, added very largely to the consumption, and consequently necessitated a large outlay for meters and service pipe. The consumers the Consolidated Company gained at that time have, scarcely with an exception, remained, and have expressed themselves peafectly satisfied, both with the gas supplied and the bills rendered. On the 1st of April, 1878, the number of consumers on the books amounted to 1,226, against 766 on the 1st of April, 1878, showing an increase during the year of 460, among whom are many large consumers. The amount of consumption for the past year, as shown by the station meter, was 80,596,300 feet, and the amount of gas registered by the consumers' meters was 70,944,000 feet, showing a leakage by condensation and otherwise of 11½ per cent. After deducting the amount consumed at the works and offices, of which no record is kept, this will bring the leakage down to about 10 per cent., which is below the average. This report was signed by President A. Garrison.

ABOUT THE QUANTITY CONSUMED.

The only matters of moment in any of the other reports, not mentioned in that of the President, were contained in the report of the Chief Engineer, Mr. Duff, from which it was learned that the total amount of gas made during the year was 80,625,700 cubic feet. The maximum consumption in 24 hours was 380,809 cubic feet, which occurred on December 5th. The minimum consumption was 116,500 cubic feet, which was in July during the riots. The engineer advises the building of an additional purifier, as the purifying capacity is insufficient, and the hydraulic main is broken in several places and should be replaced.

The recommendations of the Chief Engineer were referred to the incoming Board, and the other reports approved as read

The judge of the election announced to the meeting that there were 4,614 shares of stock voted, resulting in the election, without opposition, of the following gentlemen:

President—H. M. Bennett.

Treasurer—D'Arcy E. Boulton, Jr.

Directors—Robert Pitcairn, William Drew, W. W. Young, J. J. Speck, John B. Jackson.

The Board at its meeting for organization, will elect a Vice-President and Secretary.

The result of the election yesterday very effectually dispels the illussve stories that there should be a Board elected in the interest of Dr. Hostetter and the old Pittsburg Gas Company. At least a majority of the above named gentlemen are recognized as among the most determined of the opponents of any scheme looking to a unity of action, or any other relations than those of business rivals, with the Pittsburgh Company.

The Coal Business at Cincinnati.

To the Editor of the Iron Age: Illustrative of the extensive coal business done at Cincinnati last year, I find from the recent annual report of Col. S. D. Maxwell, Superintendent of the Chamber of Commerce, that over 40,000,000 bushels of coal was handled by our dealers. This very large amount gives Cincinnati the front rank as the largest coal distributing point west of Pittsburgh: four-fifths of all the coal comes from the latter place, the balance from West Virginia and Ohio.

It is an interesting fact that the powerful tow-boats bring down the Ohio from Pittsburgh acres of coal in area, displacing a depth of water six to seven feet, an ordinary tow-boat being able to safely pass all the bridges and danger points on the Ohio with from 200,000 to 250,000 bushels of coal. The Pittsburgh tow-boat, J. B Williams, arrived at New Orleans last month with 602,000 bushels. We understand this is the largest single tow that ever arrived at that market. The capacity of these boats which are so successfully managed in points of skill and economy, renders the cost of coal so moderate, delivered at Cincinnati by river, that all competition for this business on the part of railroads is abortive, and entirely conceded to nature's water highway. The stringency of the times and efforts of the rival extensive coal operators have resulted in cutting off all the corners in this business, until it is now conducted on the most improved hard pan basis. In proof of the advantage of river transportation over that of rail, a barge of coal containing 12,000 bushels can be delivered by river from Pittsburgh to Cincinnati for $100; by rail it would require forty cars, 300 bushels per car, at lowest cut freight rate of $10 a car, aggregating $1600—a difference of $1500 in favor of river transportation. This practically demonstrates its superiority.

To provide for the contingency of low water our dealers anticipate the wants of their trade by laying in large stocks of coal, virtually transplanting coal mines. To this end the Phillips Coal Elevator Company, located here, have increased their extensive yard facilities to cover their engagements for gas coal, to be delivered during the year to the remotest points in the West and Northwest accessible by rail. I am indebted to the courtesy of J. H. J. Smith, of the above firm, for some of the data of this communication. Our large coal elevators can now conveniently handle 10,000 bushels of coal per day; being located near the river and having complete trackage facilities, they are enabled to handle coal at a very small figure.

The future of the coal business in our city is most flattering, the average daily consumption being now at the rate of 100,000 bushels per day throughout the year, with a fair prospect of doubling that quantity within ten years.

YOUGHIOGHENY.

CINCINNATI, OHIO. May 13, 1878.

—*Iron Age, May* 16.

Flooding of the Sahara.

Mr. Donald Mackenzie recently described his scheme for the flooding of the Sahara, before the members of the Chamber of Commerce and the Philosophical Society, at Bradford. Having described the erroneous impressions that formerly prevailed as to the Sahara Desert, dispelled by the travellers of modern days, he remarked on the vast plain or hollow in the desert, known as El Juf, the greatest length of the depression being about 500 miles, the breadth about 120 miles, and the area about 30,000 square miles. This vast area was depressed about 200 feet below the sea level. The depression was formerly connected with the Atlantic Ocean by the channel Sacklet El Hamra or Red Channel, which had in process of time been blocked up with sand. It was proposed to re-open this channel and let in the sea, which would cover the great area above described, and enable commerce to be carried on with places in the interior rich in produce of various kinds, and which places were now difficult to reach. The submerging of the basin of El Juf would open up a navigable highway for the commerce of the world to the heart of Africa, and the north African slave trade would disappear in the face of the legitimate commerce and civilization. The lecturer had no doubt of the practicability of the scheme, confirmed to a great extent by Consul Hays's report to the government.

Before the actual work could be entered upon, careful surveys would have to be made, commercial relations established with the natives, who are naturally jealous, and then, while trade went on, the whole country could be explored with confidence. Cape Juby was the best port for a starting point; and

by the proposed route to the interior of the Continent the distance to be traversed would be shortened by 1,200 miles when compared with the present roads by which the caravans traveled to Timbuctoo, the principal market of the Soudan. Cape Juby is in a healthy part of the African Continent, nine days sail from England, and Mr. Mackenzie added that should the moderate sum he required be placed at his disposal he would proceed to Cape Judy next spring, establish a station at Port St. Bartholomew, endeavor to make a journey by the Waden route to Timbuctoo, invite the chiefs of the Western Sahara to enter into a treaty for trade with Soudon and its protection, and also for the abolition of the slave trade between Western Soudon and Morocco. He would also explore the basin of Ei Juf and the channel which connected it with the Atlantic.—*Polytechnic Review.*

On the Liquefaction of Acetylene, Ethyl Hydride, Nitrogen Dioxide and Probably Marsh Gas.

Cailletet, studying the compressibility of acetylene, observed a marked departure from the law of Mariotte in its behaviour, and, pushing the condensation still further, succeeded in liquefying it. The apparatus consisted of a hollow steel cylinder, thick enough to resist a pressure of several hundred atmospheres, having screwed into it at top a bronze collar carrying a thick glass reservoir closed above, and continued downward by a larger tube, open at bottom. This glass tube contains the gas to be liquefied, its lower end dipping below the surface of mercury up into the tube, compressing the gas and finally liquefying it in the narrow portion at top. In compressing acetylene, the temperature being $+18°$, numerous droplets are seen to form and run down the walls of the tube, under a pressure of eighty-three atmospheres. Reducing the pressure gradually, the liquid returns suddenly to gas filling the tube for an instant with a thick fog. Liquid acetylene is colorless and extremely mobile; it appears to be highly refractive, and is lighter than water in which it is soluble in all proportions. It dissolves paraffine and fats. Cooled to zero in presence of water and linseed oil, it forms a white compound like snow, which decomposes on heating or lowering the pressure. The tension of the acetylene vapor is as follows: at $+1°$, 48 atmospheres; at 2·5, 50; at 10, 63; at 18°, 83; at 25°, 94; at 31°, 103. Comparing the tensions of acetylene, ethylene, and ethylene hydride (C_2H_6) which contain in equal volumes, equal weights of carbon united to increasing quantities of hydrogen in the ratio 1 ; 2 : 3, the author finds the tension of acetylene at 1°, as above, to be forty-four atmospheres; that of ethylene at 0° according to Faraday, being forty-six atmospheres, and that of ethylene hydride—now liquefied for the first time by Cailletet—at 4° being forty-six atmospheres, its liquefaction taking place at a pressure a little less than that of acetylene.

In a subsequent paper, Cailletet announces the liquefaction of nitrogen dioxide, by a pressure of 104 atmospheres at $-11°$. At 8°, the dioxide is still gaseous under a pressure of 270 atmospheres. Marsh gas, compressed by 180 atmospheres at 7°, shows, when the pressure is suddenly diminished, a thick fog like that given by carbon dioxide under similar circumstances; whence the author hopes to effect its liquefaction.—*Amer. Jour. of Science and Arts.*

Heating and Cooking Apparatus.—Mr. Travers has once more, in a neat little pamphlet, called attention to the use of gas for heating and cooking purposes. He further suggests, in a letter which we publish elsewhere, the advisability of having an exhibition of useful apparatus for heating and cooking purposes at the coming meeting of the British Association of Gas Managers. We have a fear that Managers and Directors are not yet awake to the advantages they might derive from a large summer sale of gas, which can only be promoted by the extended use of gas for culinary purposes. If this could be effected, every bench of retorts might be at work all the year round, except so far as repairs and re-settings would be required. Stokers would be more satisfied; Managers, we think, would not be overworked; and Shareholders, we believe, would profit. London, we think, is not the place in which an exhibition is most needed. A stroller down the Strand has only to make use of his eyes. On the right-hand side of the way, from the Adelphi to where once stood Temple Bar, he will see several shops in which he will find displayed the best and most useful gas apparatus for heating and cooking purposes.—*Journal Gas Lighting.*

Prices of Gas Coal.

In the absence of any demand for gas coal the market is very quiet. Most of the consumers have made their contracts, and the business for the coming six months will be one of detail on delivery. The reduction in price of West Virginia coals to $5 at New York seems to have induced those consumers who had coal to buy to complete their purchases, and the market for domestic coal may be considered full.

Continued depression in coastwise freight enable New England purchasers to lay in their supplies at very satisfactory prices, as compared with those current for New York delivery.

We hear of further orders for New Pelton Newcastle coal at $3.75 @ $3.85 at New York, all expenses included.

No further operations in foreign cannel, the cost of importation being too near the price of the Kanawha cannel, to induce orders.

The past week has been an active one for the coal consumers on the line of the Chesapeake and Ohio Railroad. The shipments from Richmond amounted to fully 6000 tons, of which 2000 tons were cannel.

Three steamers and one sailing vessel have arrived since our last with Provincial coal. The importation of this grade of coal promise to exceed those of last year, the bulk of which will be sent to New York.

We continue our quotations unchanged.

	At New York.	
Westmoreland	5.50	(4.00 at Baltimore.
Penn	5.50	(4.25 at Philadelphia.
Waverly Youghiogheny	5.25	
Moore's "	5.50	
Shafton	5.35	
Despard Marion	5.15	
Newburgh Orrel	@	3.85 at Baltimore.
Murphy Run	5.25	
Chesapeake and Ohio Agency Coal	5.25	4.00 at Richmond.
Newcastle	3.75 @ 3.85	
Provincial	4.15 @ 4.50	
Cannelton Cannel	10.00	
Ince Hall	8.00	

ERRATA.

In printing the remarks of General Roome, at the meeting of the New England Association of Gas Engineers, in our issue of April 16, page 164, near the foot of the first column, an error was committed; it should read, "Do not go above *eighteen*," instead of "do not go above thirteen, as printed.

Gas Stocks.

Quotations by G. W. Close Jr., Broker and Dealer in Gas Stocks.

(with W B Scott & Co.,)

24 Pine Street, New York City.

June 3, 1878.

☞ All communications will receive particular attention

☞ The following quotations are based on the par value of $100 per share. ☜

Gas. Co.'s of N. Y. City.

	Capital.	*Par.*	*Bid.*	*Asked.*
Central, Westchester	466,000	50	75	85
Harlem	$1,850,000	50	87	91
Manhattan	4,000,000	50	195	198
Metropolitan	2,500,000	100	130	133
" Scrip	$1,000,000	...	100	103
" Bonds	500,000	1000	100	—
Mutual	5,000,000	100	75	80
" Bonds, gold.	900.000	1000	—	105
Municipal	1,000,000	100	95	100
New York	4,000,000	100	100	103
Suburban, W'sch'str	390,000	50	—	100
Gas Co.'s of Brooklyn.				
Brooklyn	2,000,000	25	147½	—
Citizens	1,200,000	20	70	—
" Scrip	320,000	1000	95	97½
Peoples	1,000,000	10	25	35
" Bonds	$ 325,000	...	--	95
" Scrip	300,000	...	75	80
Metropolitan	1,000,000	100	—	75
Nassau	1,000,000	25	--	78
" Ctfs.	700,000	1000	96	98
Williamsburgh	1,000,000	50	90	95
" Scrip		...	95	97
Union Co. E. N. Y.		25	—	50
Richmond Co., S. I.	300,000	...	80	90
Out of Town Gas Companies.				
Bath, Maine	70,000	100		
Buffalo Mutual, N. Y	750,000	100	65	70
" Bonds	200,000	1000	95	100
Baltimore, Md.	2,000,000	100	134	134
" Ctfs., gold	1,000,000		106	110
Bayonne, N. J.		100		90
Brockport, N. Y.	25,000	100	...	80
Citizens, Newark	918,000	50	109	110
Chicago Gas Co., Ills			150	
" " Bds.	124,000	—	105	107
Cincinnati G & C Co				190
Derby of Conn.	160,000	100	60	80
East Boston, Mass.		25	132	--
Elizabethtown, N. J.	300,000	20	—	130
Fort Wayne, Ind.		100	...	—
Hannibal, Mo.	100,000	100	95	100
Hartford, Conn.	700,000	25	184	186
Hempstead, L. I.	25,000	100	...	—
Jersey City	300,000	20	155	160
Jamaica, L. I.	25,000	100	...	—
Jacksonville, Ill.	120,000	50	82	...
Lewistown Maine	400,000	100	70	80
Lima, Ohio,	60,000	100	—	...
Bonds	30,000		90	
Laclede St Louis Mo.	1,200,000	100	100	110
Long Branch		20	40	50
New Haven, Conn.		25	100	
Peoples, Jersey City		...	120	125
Peoples of Albany	650,000	100	--	27
" Bonds	350,000	1000	--	-
Peoples of Baltimore		25	51	52
" Bonds			106	---
Plainfield, N. J.	80,000	100	---	105
Perth Amboy		25	---	95
Rochester, N. Y.		100	50	60
Woonsocket, R. I.	150,000	100	100	...
Halifax N. S.	400,000	40	148	150
Hamilton, Ontario	150,000	40	117½	
San Francisco Gas-Co., S. Fr'isco Cal.			93	94
St. Louis, Missouri	600,000	50	73	75
Stillwater, Minn.	50,000	50	—	26
Saugerties, N. Y.	15,000	100	95	100
Troy, Citizens	600,000	100	—	60
Toledo, Ohio			95	97
Washington, D. C.		20	230	240

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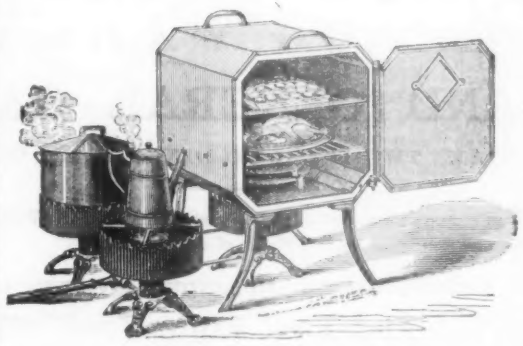

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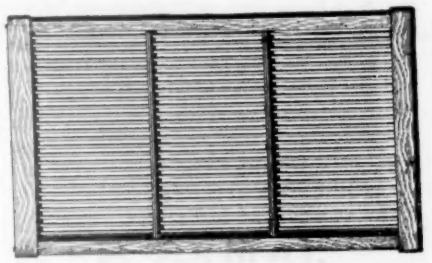

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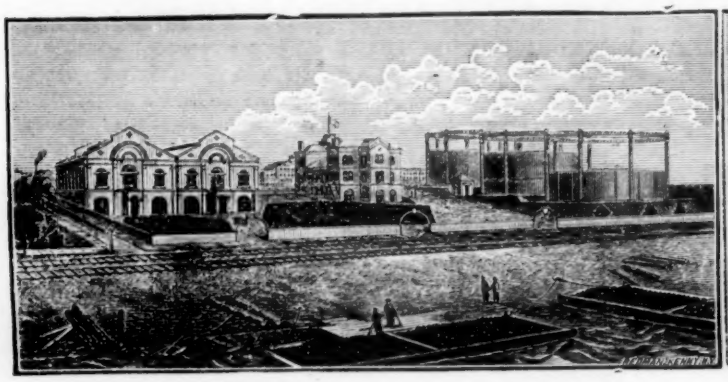

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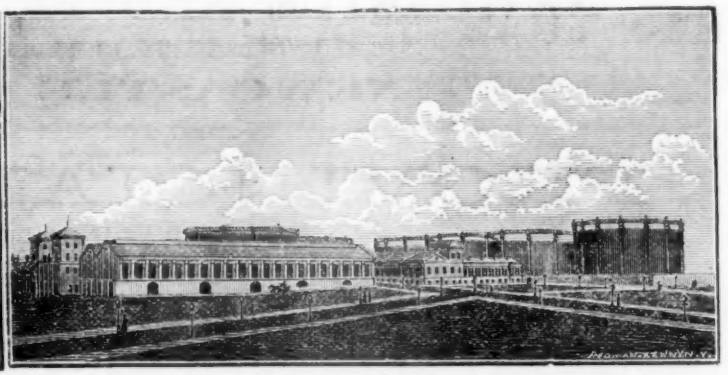

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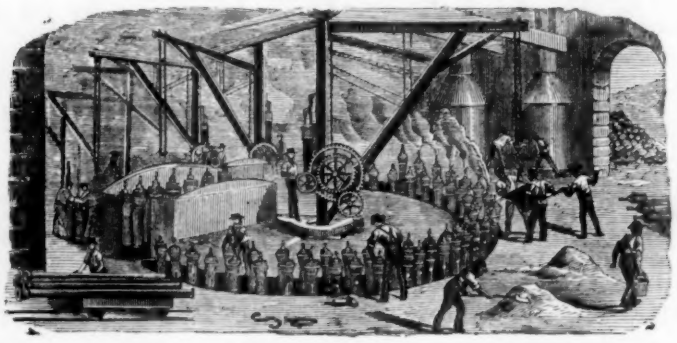

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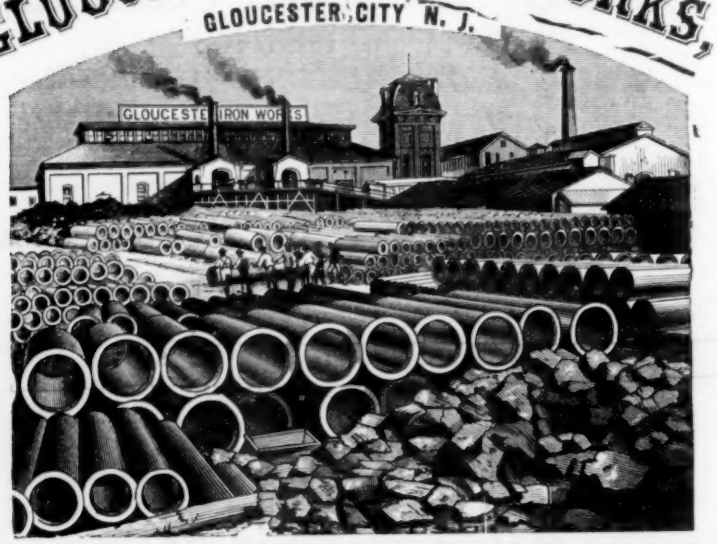

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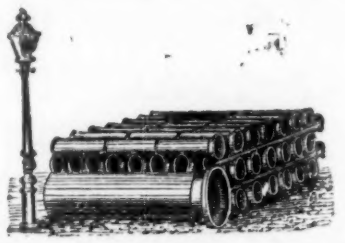

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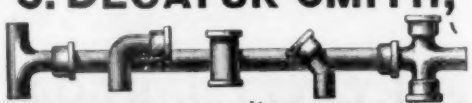

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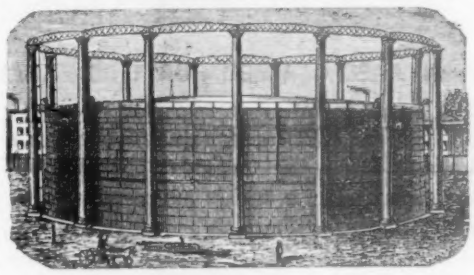

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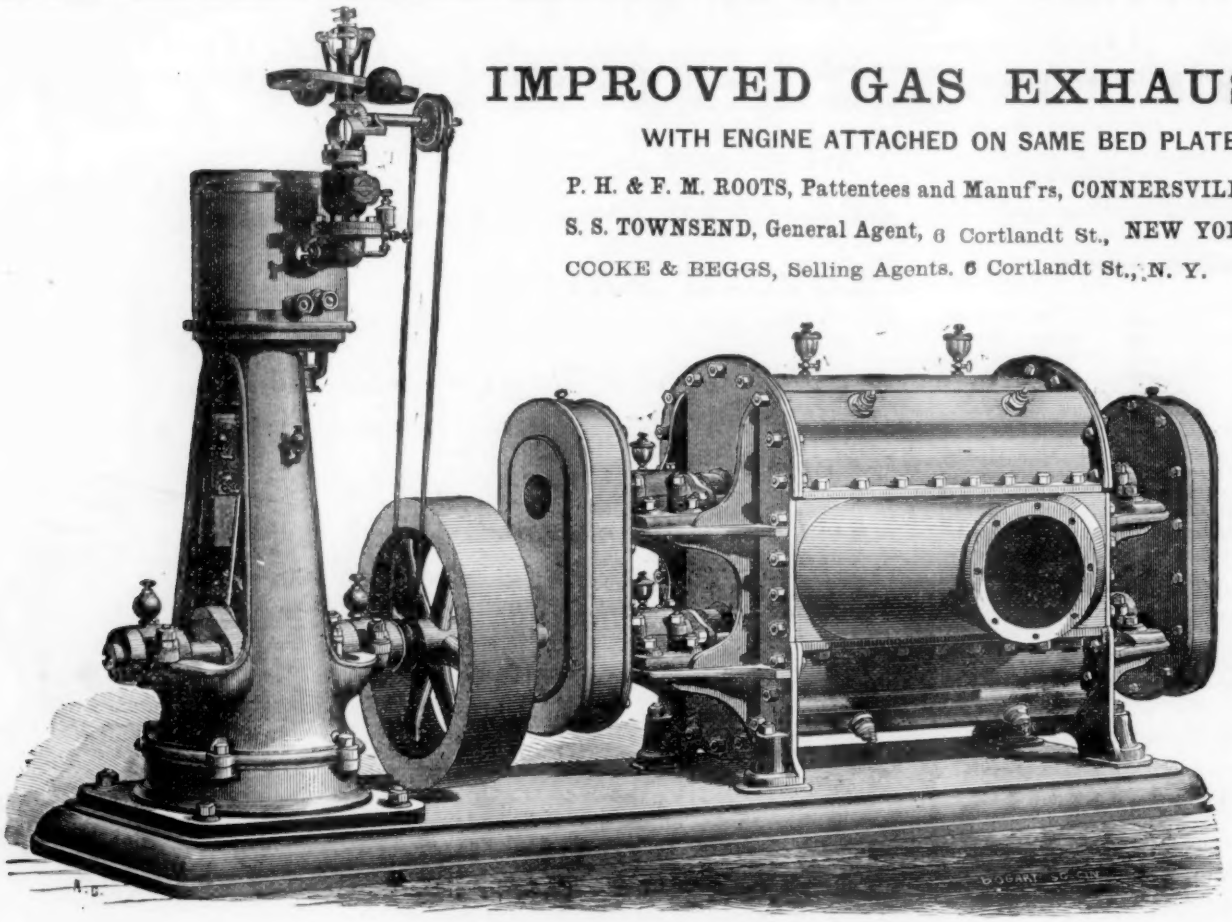

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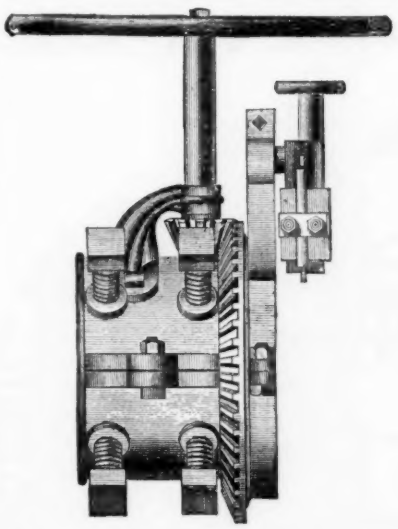

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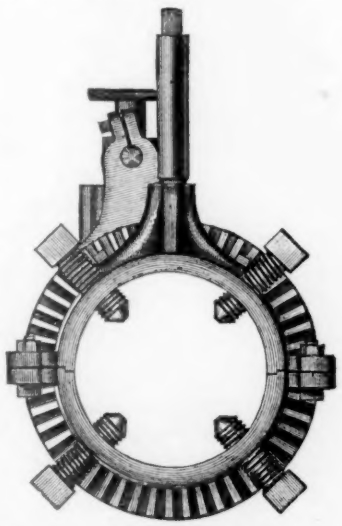

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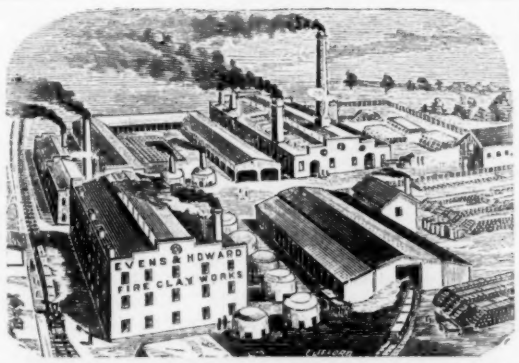

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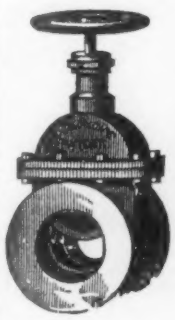

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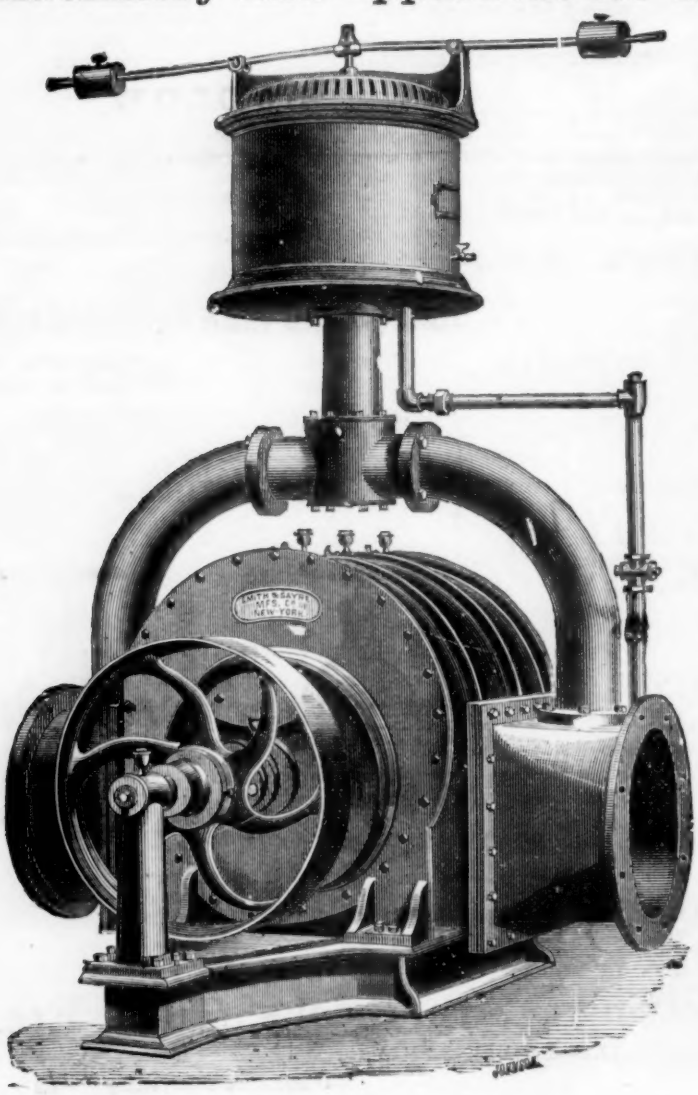

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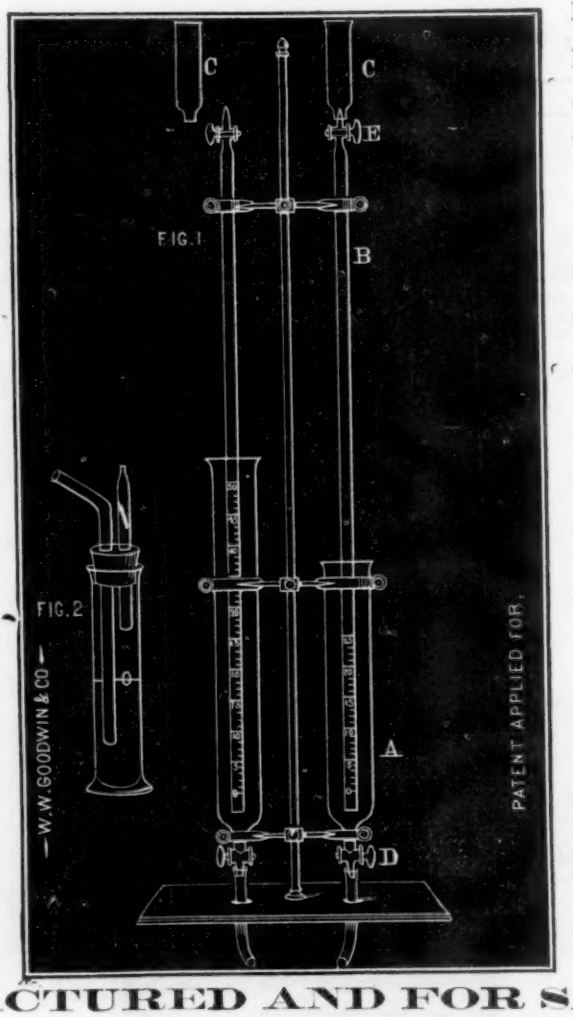

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